



ACTIVE ASSOCIATE UNITS:

Benefits and Drawbacks

GRADUATE RESEARCH PROJECT

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AFIT/IMO/ENS/10-12

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AFIT/IMO/ENS/10-12

ACTIVE ASSOCIATE UNITS;
Benefits and Drawbacks

GRADUATE RESEARCH PROJECT

Presented to the Faculty

Department of Systems and Engineering Management

Graduate School of Engineering and Management

Air Force Institute of Technology

Air University

Air Education and Training Command

In Partial Fulfillment of the Requirements for the

Degree of Master of Science in Logistics

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June 2010

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10 JUNE 2010

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Abstract

This study used the Delphi method with Subject Matter Experts (SMEs) to identify benefits and drawbacks of Active Associate Units (AAU). From these lists the SMEs then rated their level of agreement in three areas to determine where a consensus of opinion exists. The three areas of interest were: 1) which are believed to be most important for Air Mobility Command (AMC) to track for best practices, lessons learned, and trends, 2) which ones impact the capability of AMC, and 3) which are most appropriate for a comparison of Air Mobility Command Active Associate Units and strictly Active Duty Units. The general findings showed a consensus of agreement toward the list of benefits initially provided by the individual Delphi members and a trend that the provided drawbacks were more individually perceived and therefore did not achieve the same level of positive consensus as the benefits. This research has consolidated corporate knowledge and highlighted areas where AAUs are meeting expectations. The author incorporated numerical ratings of the data, Delphi participant comments, and personal conversations and experience to conclude the five most important benefits and drawbacks for AMC to consider as they look to develop metrics and determine effective ways to evaluate AAUs.

For my beautiful wife and daughters, thank you!

Acknowledgements

I would like to express my sincere appreciation to my advisor, Dr. Alan Heminger for his insight and guidance helping me throughout the research process. Additionally, a special thanks to my sponsor, Col Michael Peet, Director, AMC/A8X and Mr. Wesley “Buz” Beam AMC/A8XP, for supporting me and allowing me the latitude to conduct this research. Next, with the requirement to respect their anonymity, I sincerely thank the panel of experts who gave of their own free time, sharing their experience and wisdom in the field of Active Associate Units. Their purposeful reflection, candid discussion, and focused consideration during the process of this Delphi study are greatly appreciated, it would not have happened without them.

Table of Contents

	Page
Abstract	iv
Dedication	v
Acknowledgements	vi
Table of Contents	vii
List of Figures	ix
List of Tables	x
 I. Introduction	 1
Background.....	1
The Problem	6
Research Questions	8
Research Focus.....	8
Research Assumptions and Limitations	9
 II. Literature Review	 10
A History of Association.....	10
Associations Defined.....	10
General Benefits of Associations	13
General Expectations.....	14
The Third Step, Set Improvement Targets	17
The Seventh Step, Confirm Results and Process.....	18
What's known about AAUs?.....	19
 III. Methodology	 24
How to use the Delphi Method.....	24
Develop the Research Question.....	26
Design the Research	27

Research Sample	28
Develop Delphi Round One Questionnaire	28
Delphi Pilot Study	29
Release and Analyze Round One Questionnaire	29
Develop Round Two Questionnaire	30
Release and Analyze Round Two Questionnaire	30
Develop Round Three Questionnaire	31
Release and Analyze Round Three Questionnaires.....	32
Verify, Generalize and Document Research Results.....	32
IV. Results and Analysis	33
Results	34
Analysis	37
Benefits.....	37
Drawbacks	49
V. Discussion.....	56
Looking at the General Benefits of Associations	56
Conclusions	58
Top Five Benefits	59
Top Five Drawbacks.....	59
Additional Information.....	60
Weakness of the Study	61
Future Research.....	62
Bibliography	63

List of Figures

Figure	Page
1-1. C-130/KC-135 Average Age	2
1-2. C-130/KC-135 Average Hours	2
1-3. Pilot Requirement Increase/year	3
3-1. Three Round Delphi Process	26

List of Tables

Table	Page
4-1. Analysis of Active Associate Unit Benefits	35
4-2. Analysis of Active Associate Unit Drawbacks.....	36

I. Introduction

Background

The Air Force has had to balance the Force Structure between the active duty (AD) Air Force, Air Force Reserve Command (AFRC) and Air National Guard (ANG) for decades. This history is long and rooted with a mixture of capability, budgetary and politically motivated challenges. The ANG and AFRC are similar enough in some respects that for the remainder of this paper, the combination of both components will be referred to as the Air Reserve Component (ARC) unless there is cause to differentiate them. Future Total Force (FTF) programs of the past have implemented force structure models in response to pilot shortages, leading to the creation of associate units. The goal of these original associations was to gain access to ARC pilots to satisfy war plan requirements. At that time pilot shortages were the catalyst for this shift in force structure. More recently there has been a new change to the force structure through a new type of associate unit.

Two main problems are attributable to creating this new form of association: aircraft and manning. The issue of aircraft refers to the aging, be it yearly and or hourly, of C-130 and KC-135 aircraft within the AD Mobility Air Force (MAF). The AD Air Force flies aircraft which are on average older and or have a substantially higher number of hours per airframe than the ARC; this is especially true for the C-130. This was not always the case, but it is a fact in today's environment. Data extracted from the Air Force Portal web-based application, Logistics, Installations and Mission Support (LIMS)-Weapons System View as of January 2010, is displayed in figures 1-1 and 1-2. They respectively illustrate the difference between the average age in years for ARC C-130 and KC-135 aircraft compared to the AD; and also the difference between the average hours per airframe.

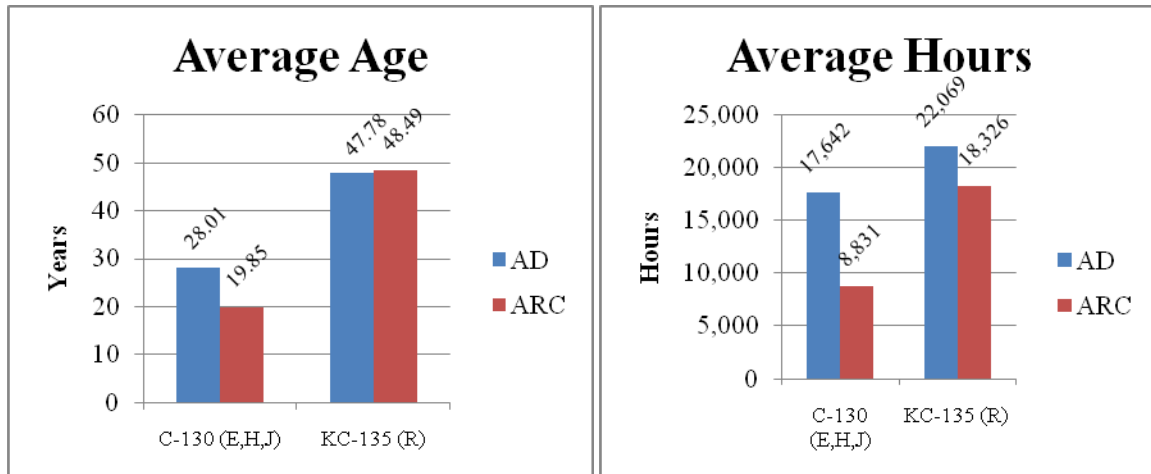


Figure 1-1
C-130/KC-135 Average Age

Figure 1-2
C-130/KC-135 Average Hours

In testimony from Michael Wynne, Secretary of the Air Force, he stated that the average age of a KC-135 was 41 years and a C-130 was 25 years. Furthermore, he is quoted as saying:

As our equipment ages, it requires more frequent maintenance and replacement of parts; meanwhile, increased OPSTEMPO accelerates wear and tear on our equipment and operational infrastructure, exposes our equipment to extreme conditions and, in some cases, delays routine maintenance. (Wynne, 2007, p. 9)

This statement from a high level Air Force official supports the importance of the issue by acknowledging the challenge of aircraft aging.

Along with understanding the critical aircraft issues the AD Air Force faces, it is also important to highlight the topic of manning in the AD Air Force. Once again a pilot shortage represents a part of the requirement to establish new associations. The Air Force has seen a rapid increase for pilot requirements driven by emerging missions such as the MC-12, U-28 and Unmanned aircraft systems (UAS) as illustrated in figure 1-3.

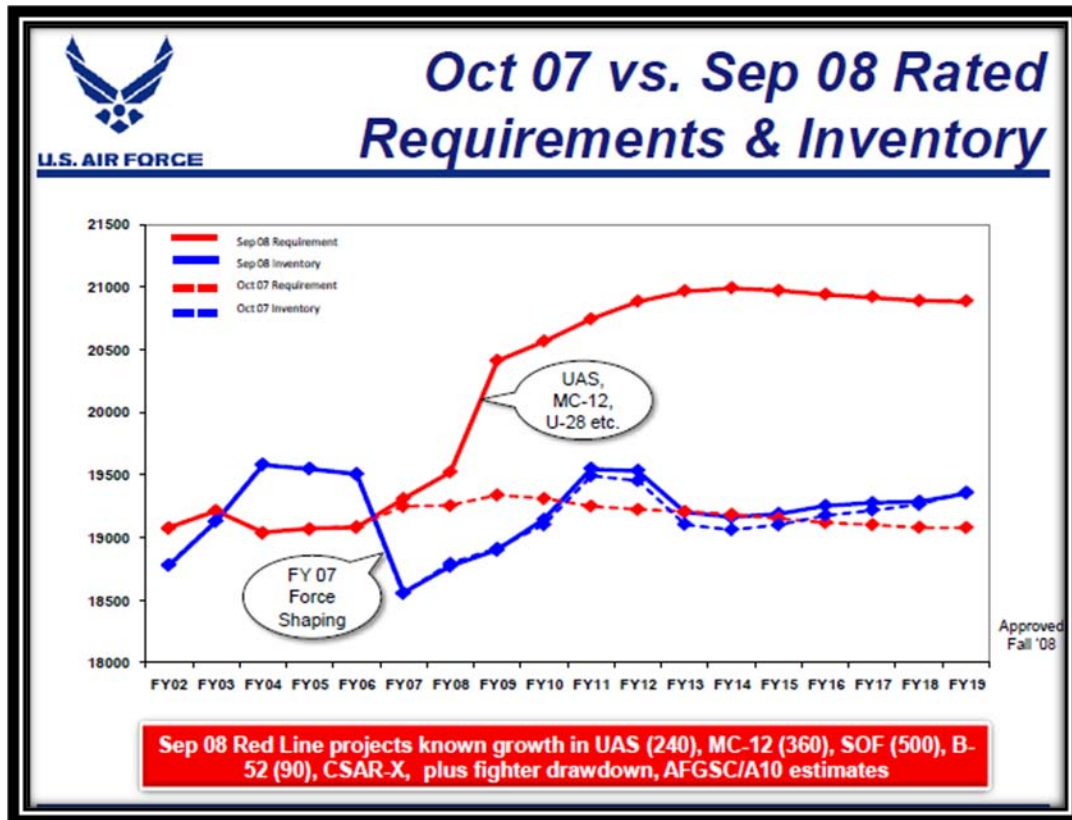


Figure 1-3 Pilot Requirement Increase/year (HQ USAF A30-AT, Feb 09)

Working within the constraints of a limited defense budget, stressed from 15 years of active engagement overseas, the Air Force was driven to change its force structure. The result was Program Budget Decision (PBD)-720 which directed the draw-down of active duty forces by 40,000 troops to meet budgetary requirements; allowing the Air Force to continue to recapitalize aircraft. This decision did not come without deliberation or consequence, the merits and magnitude of which are an entirely different subject. However, one implication of the decision is important to highlight. The program implemented to drawdown the force did not sufficiently discriminate or effectively analyze the ratio of Air Force Specialty Codes (AFSC), allowing large numbers of the more experienced personnel in critical year groups to separate. This illustrates just one example of the challenges the Air Force faces with respect to manning and experience levels of the forces. Many other AFSCs are stressed to include our MAF maintenance AFSC.

AAUs are also being considered for some High Demand-Low Density careers field missions. These manpower challenges will endure and likely worsen as the Air Force continues to shift skill sets to meet wartime requirements for the new and evolving mission sets mentioned above.

Presently, Airmen are meeting the challenges of filling CENTCOM shortfalls in several critical roles which are non-traditional for Airmen, including Convoy Support, Detainee Operations, Protective Service details, Law and Order Detachments, Military Transition Teams, and Provincial Reconstitution Teams. (Wynne, 2007, p. 33)

Following eight years of consistently high wartime operations tempo, the Air Force's level of commitment to supporting the fight, wherever it is able; is clearly represented by the Air Force Chief of Staff, General Norton Schwartz's statement, "The Air Force is all in!"

The AD Air Force is currently flying aircraft at rates well ahead of pace for their scheduled life-cycle; combined with the ever growing practice of doing more with less, we see a continued need for improved efficiencies. Within this context it becomes clear the Air Force must continue to explore new means to effectively meet combatant commander's (COCOM) operational requirements. The aging of the aircraft fleet and the stressed manning issues, where airmen are accomplishing more missions with less capable equipment, induced by high usage, are both highly relevant issues for Total Force Integration (TFI) to be explained later.

One solution for the challenges listed above was to seek, through TFI, access to newer and less utilized aircraft in conjunction with a highly experience workforce which resides in the ARC. The concept for sharing aircraft between AD and the ARC is not new. These traditional models are called Reserve Associate units, where the AFRC associates with AD units on AD

bases which are budgeted the operations and maintenance (O&M) funds for Primary Assigned Aircraft (PAA). The contingencies, OPERATIONS ENDURING FREEDOM (OEF) and IRAQI FREEDOM (OIF) started in 2001 and 2003 respectively and continue through the present day. The result has been a very high operations tempo and new mission requirements driving the previously mentioned increased demand for pilots and many other skill sets, not readily available after the implementation of PBD-720. As a result the TFI office in HAF/A8XF has overseen a relatively new force structure model, the Active Associate Unit (AAU). These were initially termed “Reverse Associate” units, not to be confused with the traditional “Reserve Associate” units. These have since been officially labeled the Active Associate Unit (AAU). This unit construct is a squadron of AD members stationed with an ARC host unit and tasked with flying and maintaining aircraft under the operational control of the host ARC’s command. The general intent was, again, to gain access to better aircraft, with an immediate focus for use in Overseas Contingency Operations (OCO). A secondary benefit was to access the greater experience levels of ARC members. The hope was also to offset some of the lower skill level manning on AD. Flying some newer aircraft, with fewer hours, the general belief was this structure could potentially increase reliability and availability rates of those type aircraft in overseas operations and or provide more availability here at home for CONUS missions and training. In addition, with new AD Unit Type Codes (UTC) at the ARC bases there would be more aircraft available to the AD for surge requirements without having to activate the ARC. As these types of units are still relatively new, some questions remain unanswered. One important question is, has the AD Air Force and Air Mobility Command identified the correct metrics or measures to determine if these generally expected benefits are being realized?

Total Force Integration continues to progress and it is both important and appropriate to review the progress of the AAU model. Continuing to study the benefits and drawbacks of AAUs may aid future decisions as to whether the Air Force and or AMC should continue their use or help determine how to maximize their benefit.

The Problem

The roadmap for the many planned future associations necessitates checking the effectiveness of current AAUs. While conducting research on this subject, a great deal of information pertaining to new units and the growth of Total Force Integration was discovered. However, a noticeable void appeared with regard to organized research containing expected or achieved performance data or metrics for AAUs. Although some data exists between personnel and staff directorates associated with AAUs, the researcher was unable to find the information through a medium available to public audiences or in research papers. Regardless of the data currently available, a more important concern is the lack of detail or clarity for the generally intended benefits of the AAUs as well as a lack of standardized or approved metrics for measuring performance. This could account for why the researcher found no published analysis of the benefits or drawbacks of Active Associate Units, with or without cost as a variable. AFRD 90-10, Total Force Integration Policy, states the following with regard to MAJCOM responsibilities;

12.1.9. Develop metrics for evaluating whether integration initiatives are creating the desired effects. The metrics should address the overall objectives of the proposed integration as stated in the implementation plan and also should address the objectives of other implementation documentation such as MOAs, MOUs and Support Agreements (SAs). (HQ USAF/A8, 2006, p. 4)

Consequently, a need exists to retro-actively determine which method(s) to use for a benefit analysis of the AAUs. It appears a cost benefit between strictly AD and AAUs would be the simplest to analyze, however, not necessarily the easiest to accurately compile and deliver. In addition you will see, cost, is not the only variable in this complex issues and by itself would not be a complete evaluation.

The first step in determining a comparative analysis should include a conscious decision regarding which issues are most relevant, so subsequent time invested in the analysis will not be wasted generating data, useless to a decision maker. Therefore, the purpose of this study will be to determine which benefits and drawbacks Air Mobility Command (AMC) should consider most important and appropriate to use for analysis of the AAU's progress and for comparison between AAUs and strictly AD units. To achieve the answer to these research questions, the author will use the Delphi method with subject matter experts (SME) having leadership experience, current or previous, within an AAU. The goal will be to determine where a consensus of expert opinion exists for this problem. The Delphi method will be discussed in detail in the methodology section of this paper. This study seeks to answer the following questions.

Research Questions

Question 1

What benefits and drawbacks of Active Associate Units are important for Air Mobility Command to track for best practices, lessons learned, and trends?

Question 2

What benefits and drawbacks of Active Associate Units impact the capability of Air Mobility Command?

Question 3

What benefits and drawbacks of Active Associate Units are appropriate for a comparison of Air Mobility Command Active Associate Units and strictly Active Duty Units?

Research Focus

If simply providing more aircraft to the fight were the sole aim, then the AAU model would appear to be a success. However, with cost constraints from a shrinking defense budget there is need to follow through and determine what impact AAUs are having to capability and ultimately at what cost. The first research question seeks to identify benefits and drawbacks of interest to AMC; worth tracking for best practices, lessons learned or trends. This question could potentially help organize positive or negative data which may not be suitable for comparative analysis to determine better capability or efficiencies, but may prove beneficial to better operations and leadership practices. The second research question seeks to identify which benefits and drawbacks have an impact to the capability of AMC. Finally, the third research

question will show benefits and drawbacks which are appropriate to use while comparing strictly AD units and AAUs.

Research Assumptions and Limitations

The methodology of this research was the Delphi method utilizing subject matter experts to determine consensus of opinions. One limitation is the ARC may not share the same views as Active Duty and they were not asked their opinions on the benefits and drawbacks of AAUs. In addition, due to time constraints the researcher did not thoroughly vet his ideas for research questions with AMC. They were derived based on conversations with AMC and other members of AAUs.

The assumption of the author is that personnel within the Air Force can research and determine which portions of the budget are attributable to different AAUs and consequently determine a cost benefit analysis. This research methodology was engineered to help focus data collection to benefits and drawbacks which are important to consider when developing metrics. Those metrics in turn can subsequently be used to derive cost benefit conclusions as one of multiple variables in evaluating AAUs.

II. Literature Review

A History of Association

The application of flying unit associations has a long history; they date as far back as 1968 when the idea was tested. “Initially, not many in the Air Force or AFRC greeted the test Wing with much enthusiasm, but the test proved so successful, that the Air Force formed many other Associate units.” (Harlan, 1993, p. 8) Through the years which followed, the Air Force Reserves have associated on AD bases using those aircraft to remain proficient and allow a state of readiness in the Air Force which would otherwise not have been possible. Despite the initial opposition the AD and AFRC worked through the cultural challenges. When associations began the constraint to capability was personnel shortages, induced by manning requirements for certain wartime contingencies. Those contingency plans required aircraft to fly at a greatly increased utilization rate for a surge period, during which the ARC would be activated to enable this capability. Since the inception of associations, the types of units and locations have varied over time; demonstrating their versatility as a useful tool in the apportionment of manning and aircraft in force structure.

Associations Defined

The Association has multiple variants and uses; the Air Force has formally recognized the following five different types of associations:

1. Classic Associate Unit
2. Active Associate Unit
3. Air Reserve Components Associate Unit
4. Integrated Associate Unit
5. Fully Integrated Unit

Please refer to AFD 90-10 for detailed definitions of each association. The primary difference of importance to this study is the difference between Classic Associate and Active Associate Units. To reiterate, Classic Associate Units exist where the AD component owns the weapons systems and the ARC provides crews to share those assets. The AAU is the reciprocal of this type of unit. The first AAU, initially known as the “reverse associate” because it was the opposite of a classic association, was established in 1995 when the approximately 300 special operations C-130 active duty flyers and maintainers moved to nearby at Duke Field joining the 909th Special Operations Wing. The 8th Special Operations Squadron has been actively engaged in worldwide contingencies with the host reserve unit ever since. (AFSOC Public Affairs Office) Their accomplishments, along with many other unit associations, have been generically recorded with stories of “mission success.” This is also the case with the first Air Mobility Command (AMC) AAU. In July of 2006, the 30th Airlift Squadron was stood up and represented more than just a new unit, “it also represented a new idea for the Air Force. Previous associate unit arrangements have been the [classic] or reverse version of the one thriving in Cheyenne.” (Lockwood, 2007) This was also the first time AD personnel were tenants of an Air National Guard base for an operational flying mission. This appears to be an example of the right unit at the right time. As you will see, not all members of the Air National Guard originally shared the sentiment of the 153rd Airlift Wing Commander at Cheyenne who said, “Some people see the active association as an experiment. We see it as a way to make sure the nation gets the most out of its airplanes, air crews, and tax dollars.” (Lockwood, 2007) This philosophy may have resulted from some wise insight delivered back in 2001. At that time, a prominent member of the Kansas National Guard was dead set against the idea of active service members owning aircraft at a flying guard unit. The dissent was formed in two parts, first one of culture, the

second related to mission priority. The first part of the opposition was a cultural ideology rooted in pride of ownership. Major General Greg Gardner was the Adjutant General for the Kansas National Guard and is recorded as saying he felt the morale of the ANG units would be hit hard if AD personnel came to fly with them and took operational control of the aircraft. “Ownership is important. When was the last time you washed a rental car?” (Castellon, 2001, p. 18) On AD a maintenance crew chief may spend a year or two working on a particular aircraft, while in the ARC, it is not uncommon for a crew chief to own the responsibility for the same aircraft for 10 to 20 years. He then raised a legitimate question, “If the active duty can have [the equipment] whenever they want to support the nation, then what does it matter what’s painted on the tail?” (Castellon, 2001, p. 18) The number of jobs and pride of ownership associated with these ANG and AFRC bases is not insignificant. This is similar to the cultural challenges originally faced when the AFRC associated with AMC flying C-5s and C-141s, but those challenges have been overcome.

His more weighted opposition related to who has priority in an emergency. To be good stewards of the resources provided by the nation’s taxpayers it is very important to comply with both the intent and letter of the law with regard to expending funds under USC Title 32, National Guard (funding for National Guard of each state) and Title 10, Armed Forces (funding for Active Duty and Air Force Reserves). The National Guard, unlike the Air Force Reserves also has a state mission whereby the Governor can activate the unit under United States Code (USC) Title 32, “National Guard.” This is a serious issue, which requires deliberate attention to ensure legal compliance. If the AD owns the aircraft and equipment on the base, “the question of what guardsmen can use in a [state] emergency gets muddy.” (Castellon, 2001, p. 18) Assuming the AD is in some fashion going to utilize ANG assets, this last statement is an argument for AAUs

rather than simply putting the aircraft under the control of the AD. The National Guard, out of which grew the Air National Guard, has a long history dating back to before the revolutionary war. State militias with separate funding are vital to state independence and the ability to avoid looking to the federal government for assistance in all emergencies. Some may ask why state militias need fighter aircraft or large cargo planes. The real strength of the National Guard is the dual use available from manpower; able to respond to state emergencies plus have the ability to retain qualified military members for large scale national requirements.

The success, at least in terms of relationships and commitment with the ANG, for the first AAU at Cheyenne cannot overlook the fact that the ANG retains the ownership of these aircraft. With a shrinking defense budget, more ARC units may be inclined to vie for these opportunities, seeing them as a means to shore up jobs and retain the strength of the state's emergency reserve forces.

General Benefits of Associations

With this newest type of association there were bound to be growing pains in the process of determining expectations. The Air Force did not jump into the AAU concept without purposeful effort, quite the contrary; there is a plethora of information available on the subject of TFI. The web site for the overall initiative has many interesting items; one of which is its talking points; listing what it sees as five benefits of the Associate model: (AF/XPFA)

1. Generates efficiency by sharing resources, reducing duplication of efforts, and in some cases, reduces the number of individuals needed to accomplish a task.
2. Provides contingency surge capability
3. Helps maintain aircrew and maintenance expertise and experience levels by capitalizing on active duty Air Force investment in training and exploit Guard and Reserve resident experience

4. Reduces peacetime training hours (cost savings) because of the higher experience levels of the ARC
5. Preserves a corporate body of knowledge that balances turnover in active duty units, and enhances retention and recruitment for the Total Force through personnel cross-flow.

Notice from the list above, only one of the above five items directly mentions cost as a benefit.

In terms of creating new and innovative ideas, it is important to realize value is sometimes more than a bottom line dollar. The cheapest option is not necessarily the best value; that value determination requires disciplined focus, drilling down to key benefits and difficulties, not easily identified.

Author and founder of The Delphi Group in Boston, Thomas Koulopoulos, recognized this in the difference between invention and innovation. “Simply put, innovation is change with a purpose and a vision...invention is simply change.” (Koulopoulos, 2007) Inventing the idea of an AAU was good, but is it an innovation; a move toward being great, as described by Jim Collins, author of “Good to Great?” Innovation is about imposing a discipline of value creation in an organization. (Koulopoulos, 2007) That is what needs to happen with AAUs. He challenges leaders to look at the value in these terms, “stop and think about what this means to your organization...do you measure the value of each innovation...can you quantify the investment in and the payback from innovation?” (Koulopoulos, 2007) These are the questions he feels are most important in assessing innovation, which TFI initiatives most certainly are.

General Expectations

The pattern of research shows a trend of information with perceived and general benefits, lacking specific details; this is also true for expectations with regard to performance. Unit and higher level commanders are to ensure they maintain their assigned forces in mission ready

status and follow regulations and AFIs in the same manner as the rest of the AD Air Force. In addition they have to be able to meet their requirements for Designed Operational Capability (DOC) statements as well as the UTCs. There is a lack of transparency with regard to how the MAJCOMs measure or value the way commanders attain these expectations, beyond individual performance appraisals. This lack of clarity can be viewed as positive in one regard; it both requires and allows each MAJCOM with expertise, to decide which aspects of their associations are important to them and measure what matters. This process will require thoughtful deliberation, a “discipline of value creation” to again quote Mr. Koulopoulos. The measures appropriate for AAUs may end up having some overlap with strictly AD units and that will be valuable; until they are explored however, one could inadvertently find the constraint to their organization’s success is old ideas. In Jim Collins book “Good to Great” this is an accepted concept. Assuming the old way of thinking can be the very reason organizations don’t improve. “The vast majority of companies never become great, precisely because the vast majority become quite good and that is their main problem.” (Collins, 2001, p. 1) Reading the many news articles proclaiming the success of these organizations is positive reinforcement, but if taken as an end in themselves, they could also prevent a good idea from becoming better or great.

Who then is responsible for establishing these measures of progress and ensuring continued success and improvement? As we said earlier, it is the MAJCOM. Air Force Publication 90-10 states that the responsibility to develop metrics to ensure that AAUs are meeting their purpose lies with the MAJCOM, for this research, that means AMC. Defining roles and responsibilities is important, it is also vital for the leadership within the AAUs to have an understanding of the organization’s purpose and expectation; that information creates a baseline from which to measure. This is an important step in AFSO 21’s playbook, to be

discussed further. It appears the guidance to AAU commanders was relatively clear, all-be-it general; expectations were set for commanders to meet. The basic tenets were laid out in the Concept of Employment (CONEMP) documents. The author reviewed two of these CONEMPS, one for the AFRC hosted AAU and one for an ANG hosted AAU; again they provided general direction and intent. In these documents there are only a few qualitative expectations for the Active Associate Unit. Once more there is a visible lack of identified metrics. There is an expectation for commanders and directorates within a MAJCOM reading these CONEMPS to know what levels of effectiveness are expected of them and what a “high” level of readiness is. Fortunately with this vague guidance, commanders are at least given decentralized authority to act as needed to complete their mission; this is in line with Air Force Doctrine’s tenet of Air and Space Power; specifically, Centralized Control and Decentralized Execution.

Decentralized execution of air and space power is the delegation of execution authority to responsible and capable lower level commanders to achieve effective span of control and to foster disciplined initiative, situational responsiveness, and tactical flexibility. It allows subordinates to exploit opportunities in rapidly changing, fluid situations. The benefits inherent in decentralized execution, however, are maximized only when a commander clearly communicates his intent. (AFDD1, 2003, p. 28)

The last sentence of this quote seems to indicate the likely hood that AAUs effectiveness would be maximized if clearer intent were available. At a tactical level the CONEMP guidance is achievable and measureable; did they maintain readiness, yes or no? However, this does not account for how efficiently this objective was achieved; considering benefit versus cost, be it personnel, equipment, or money. The negative consequence of decentralized control is that it can become very difficult analyzing units to a single standard when each unit’s leadership is given the authority to achieve its mission as needed, within regulation. To a certain extent, AMC

has attempted to begin the process of evaluating the AAUs with monthly Work Groups, and quarterly General Officer Steering Council meetings. (AF/XPFA) However, there can be a problem with open discussions around a conference table. For example, one overbearing or superior ranking person can drive an agenda and shut down less assertive, but equally knowledgeable people.

RAND researchers...found that bringing experts together in a conference room introduces factors that may have little to do with the issue at hand...the loudest voice rather than the soundest argument may carry the day; or, a person may be reluctant to abandon a previously stated opinion in front of his peers. (Gordon, 1994, p. 4)

This study will use a method of research to avoid these issues. There will be further discussion of the Delphi method of research in chapter three.

The Third Step, Set Improvement Targets

In the author's conversations with staff members at AMC, attempts to determine what should be done to clearly measure the success and performance of these units has begun. That statement taken out of context could be misconstrued as a witch hunt, implying they are trying to determine which unit is best. As mentioned above, the AFSO21 playbook describes many options for process improvement. Should the reader desire more detailed information regarding portions of the eight step problem solving process used by the author to illustrate his point, please refer directly to the AFSO21 playbook. Directly relevant to supporting the need for this research, step three of the problem solving process in the AFSO21 playbook is Set Improvement Targets. "Improvement targets must be set on two levels simultaneously, the strategic and the tactical." (AFSO21 Team, 2009, p. 21) These are the firm quantifiable baseline objects which

ideally would have been established before the first AMC AAU stood up, having that baseline from which to measure. This research is intended to aid in establishing what measures should be considered in the baseline. There is little doubt about the tactical level performance of those assigned to the AAUs at AD units. They appear to have met the intent of the CONEMPs. The question of evaluating these AAUs now needs to be focused, with a perspective of what is most important and best for the team's capability, not who or what do we like the most? "Problem solving is a logical, common sense, fact-based, step-by-step approach...it is a practiced skill, requiring the practitioner to apprehend what is actually happening versus what should be happening." (AFSO21 Team, 2009, p. 180) A detailed account of what is working well and what is not needs to be made and acted upon, even if it's unpopular. In line with Admiral Stockdale's quote, also from "Good to Great," he said "...you have to have the discipline to confront the most brutal facts of your current reality, whatever they might be." (Collins, 2001, p. 13) This implies that AMC needs a ruthless and honest assessment of what is benefiting AMC and what drawbacks are diminishing AMC's capability as a result of AAU operations. This can be especially difficult if an analysis were to show a better way of doing business than AAUs, considering all the positive press they have received. Just because the units are performing as requested and meeting the mission, doesn't mean the AAU, as it stands, is the right process or that they are optimized to achieve the most capability.

The Seventh Step, Confirm Results and Process

Following up on any new process is generally a wise idea. The Seventh step in the Problem Solving Process in the AFSO21 playbook is Confirm Results and Process. This requires knowing what the initial intent was for the process. We have essentially been looking to AAUs as a new process for improving AMC's ability to offer Combatant Commanders

(COCOMS) more capability. The general intents and requirements did not measurably predict the impact these AAUs were expected to have on AMC's capability. "Each project must be tracked to determine if its actual impact is different than originally projected...and to determine the sustainability of results." (AFSO21 Team, 2009, p. 26) This will be difficult for AMC to accomplish as a baseline does not appear to have been established.

In addition, members of the Air Force consistently accomplish missions which are not sourced to requested levels. A question yet to be answered is; are AAUs meeting their mission with an acceptable level of effort? "Are teams achieving their objectives by executing the plan as written or are they improving results merely by using twice as many resources or working twice as hard?" (AFSO21 Team, 2009, p. 26). This research hopes to define and record what experts in the field of AAUs have seen are the benefit and drawback constraints to consider as standards for current and subsequent evaluations of the impact AAUs are having to the capability of AMC.

What's known about AAUs?

Three key pieces of information in the study of AAUs were found. The first comes from the Rand Corporation, a nonprofit research organization that did a study under Project Air Force. The study titled "Options for Meeting the Maintenance Demands of the Active Associate Flying Units" examines different alternatives to the constraint for an ACC fighter AAU. They broke the research into two parts, to "understand the differences between ANG and active component aircraft maintenance productivity" and they "used key factors to establish staffing options for an active associate unit." (Drew, 2008, p. xiv) These researchers were apparently successful at finding metrics from maintenance data, clearly showing different options for manning constraints

under various levels of operational tempo. The research metrics are applicable primarily to fighter units as it uses terms such as UTE rates in conjunction with sortie generation. UTE rates are used in MAF units too, however they are not generally tied to numbers of sorties as closely as they are in the Combat Air Forces (CAF); yet the concepts could be of value to AMC depending on the results of this research. If maintenance effectiveness or manpower is found to be a constraint, this type of data and the research could be important to AMC as they determine means to improve efficiencies at AAUs and consider how to conduct a cost benefit analysis. For example, the authors of the AAU maintenance study show, it is important to consider all the following types of usage factors, “additional PAA added by BRAC, the increased UTE rate in support of TFI requirements and the personnel impact of a second maintenance shift should it prove necessary.” A second maintenance shift at an ANG unit, staffed by host unit members, would add significant cost and decrease the benefit of AAUs. The F-16 unit studied would need to “increase by 45 personnel to run a second shift, which may be required with an increased UTE rate.” (Drew, 2008, p. xix) The metrics in this study show potential usefulness for a person attempting to derive the metrics to quantify benefit or performance in AAUs. However, it is crucial to understand the rigor which was applied to derive the findings in their research. If AMC were to use this type of analysis it would be valuable to seek the council of these authors and ensure the assumptions they made are clear and applicable to the MAF AAUs.

An older, separate study, also done by the Rand Corporation under Project Air Force, had some areas with potential benefit for analysis of MAF AAUs. In “Principles for Determining the Air Force Active/Reserve Mix,” the author’s go into great detail describing six factors to the “right” mix. The factor which has applicable to this research is cost due to AMC’s desires to determine if AAUs are a good benefit on this basis. The research analyzed a traditional Reserve

Associate Unit (16-PAA), at an AD base, and two independent ARC units each (8-PAA). The total costs were lower in the two independent ARC units, and demonstrate, “greater equipment capacity is gained by shifting the force structure mix toward independent equipped units. However, independently equipped units would provide [fewer crews].” (Robbert, 1999, p. 73) This indicates AMC will have to prioritize what its constraint is, access to aircraft or personnel to conduct the mission.

The Air Force has seen manning fluctuations and difficulties for decades for various reasons; some self induced, others brought about by incentive in private sector prosperity. Regardless of the reason, one key constraint over the years has been pilot manning. “Absorption of new pilots into the Air Force has been a challenge for rated officer assignment personnel and is perhaps the primary driving factor toward integrating active and ARC units.” (Flick, 2004, p. 16) The issue of maintaining the correct complement of personnel in the right positions is complex and constantly fluctuating. This issue has a high priority and the Air Force has titled it Absorption; dedicating an entire chapter to it in Air Force Instruction (AFI) 11-412. Here you see absorption defined.

Absorption is the process of accessing new undergraduate flying training (UFT) graduates and/or prior qualified (e.g., FAIP, OSA) aircrews, by career field (i.e., Pilot; CSO/Nav/EWO/WSO; ABM; CEA) into operational unit line flying positions (i.e., API-1/2/9/A) for their first operational assignment. (AFI 11-412, 2009, p. 19)

In practice, it is the process of a unit taking a seasoned pilot and educating a younger one to be the next experienced member, capable of the same or better level of performance as the instructor; in this manner the process of maintaining the mission ready status of the aviator is maintained. (Flick, 2004) At its best, “the system is balanced; there is the right flow of new pilots to match the availability of instructors for initial training missions, the right mix of

experienced pilots, and the capability to generate [enough flying hours].” (Flick, 2004, p. 18)

This previous research shows AAUs could provide a level of consistency for pilot absorption and potentially represents a very important benefit if personnel shortages are a constraint.

The ARC personnel, having far more experience and a lighter work load when not mobilized, are able to train younger aviators and maintenance personnel more efficiently. This is supported in the data found from the Rand study of fighter unit AAUs, showing the greater efficiency levels of ANG maintenance compared to AD bases. (Drew, 2008) The author expects to see the experience of ARC personnel as a primary benefit in the findings of this research. The previously mentioned Rand study has a section addressing the concept of absorption from a different angle. The difference being a change from the traditional understanding of absorption, how many new pilots can be groomed for AD, to how many qualified AD personnel need to be cross-flowed out of AD to the ARC to ensure their mission readiness; an important issue to consider. The study has its own term for it; Modeling the Personnel Flow Constraint. “The active-to-reserve flow of pilots is especially meaningful...because of the length of undergraduate pilot training and subsequent weapon system training, most pilots in the [A]RC have prior active service.” (Robbert, 1999, p. 50) The ARC has a huge influence on the MAF fleet. “The ARC comprises over 50 percent of overall air mobility capability.” (AFDD2-6, 2006, p. 73) Consequently, it is important to ensure the continued flow of personnel to the ARC. This is an area worthy of base-lining to observe the future impact of AAUs on personnel cross flow to ARC units hosting an AAU versus independent ARC bases. This could be useful knowledge, if it proves to be a positive factor in AD to ARC cross flow. From the author’s own experience, the 10 year pilot commitment and the pace of operations now seen in the ARC has reduced the cross flow from AD to ARC units. This may appear to be a good thing for the AD, but again at what

cost to the total MAF capability? Perhaps AAUs will act as a hedge to the decreasing level of experience in the ARC. Absorption is a key player in force structure and should be a portion of an AAU analysis.

This concludes the applicable research of AAUs discovered by the author. There is a great deal of information available showing the general benefits AAUs were expected to provide, however, the author of this research was unable to discover formal research, metrics to analyze performance, or clear demarcation of relevant areas for analysis, suitable for AMC's purpose of determining the benefit to cost of AAUs. The following chapter will describe the methodology which will be used to answer the research questions.

III. Methodology

The technique used for this research is called the Delphi method. The author chose the Delphi method because it is compatible with this type of study. “The Delphi method is well suited as a research instrument when there is incomplete knowledge about a problem [and] works especially well when the goal is to improve our understanding of problems, opportunities, solutions, or to develop forecasts.” (Skulmoski, Hartman, & Krahn, 2007, p. 1) One of the key applications listed by Linstone and Turoff, is its helpfulness when, “delineating the pros and cons associated with potential policy options.” (Linstone & Turoff, 1975) This last statement is precisely what the author intends for the outcome of the study to produce; instead of pros and cons you will see benefits and drawbacks.

How to use the Delphi Method

The author used one primary reference as the basis for the organization of this study. Its flow and process are well suited for the scope of this topic, considering the lack of data pertaining to the issue and the size of the subject matter expert pool. This source is from The Journal of Information Technology Education. The journal article is titled “The Delphi Method for Graduate Research,” and is co-authored by Skulmoski, Hartman and Krahn. The authors describe the Delphi Method as follows.

The Delphi method is an iterative process used to collect and distill the judgments of experts using a series of questionnaires interspersed with feedback. The questionnaires are designed to focus on problems, opportunities, solutions, or forecasts. Each subsequent questionnaire is developed based on the results of the previous questionnaire. The process stops when the research question is answered: for example, when consensus is reached. (Skulmoski, Hartman, & Krahn, 2007, p. 2)

As this study pertains to the Air Force, it should interest the military readers to know the Delphi has its origins in military application. “The original Delphi method was developed by Norman Dalkey of the RAND Corporation in the 1950’s for a U.S. sponsored military project.”

(Skulmoski, Hartman, & Krahn, 2007, p. 2) The original study was done for the Air Force on a highly important issue with no other real precedence or clear alternative, as the data required for this type of forecast and assessment did not exist. “The aim of the project was the application of expert opinion to the selection , from the point of view of a Soviet strategic planner, of an optimal U.S. industrial target system, with a corresponding estimation of the number of atomic bombs required to reduce munitions output by a prescribed amount.” (Rowe & Wright, 1999, p. 354) The Delphi method needs a list of key ingredients; Rowe and Wright describe four key features listed below. (Skulmoski, Hartman, & Krahn, 2007)

- 1. Anonymity of Delphi participants:** allows the participants to freely express their opinions without undue social pressures to conform from others in the group. Decisions are evaluated on their merit, rather than who has proposed the idea.
- 2. Iteration:** allows the participants to refine their views in light of the progress of the group’s work from round to round.
- 3. Controlled feedback:** informs the participants of the other participant’s perspectives, and provides the opportunity for Delphi participants to clarify or change their views.
- 4. Statistical aggregation of group response:** allows for a quantitative analysis and interpretation of data.

This study will followed the four key factors listed above to complete the research. Below is a flowchart diagram of a generic three round Delphi process. Skulmoski, Hartman, & Krahn’s

diagram is accompanied by eleven points, which will be addressed individually, explaining how the Delphi method for this study will be accomplished. The author found it valuable to use a Delphi method template.

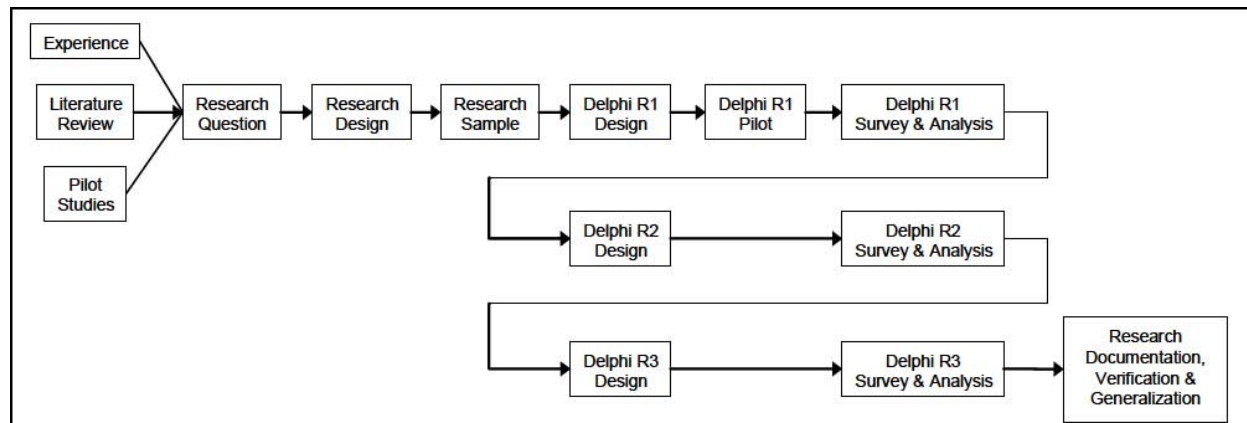


Figure 3-1 Three Round Delphi Process (Skulmoski, Hartman, & Krahn, 2007, p. 3)

In the following 11-steps the author will lay out how Skulmoski, Hartman & Krahn envision the “Three Round Process.” For each step, the author of this research will first show Skulmoski, Hartman, & Krahn’s viewpoint, explaining what the method recommends and then provide a subsequent paragraph explaining the researcher’s application of what will actually be done for that step. Deliveries of each round will be accomplished via electronic spreadsheets, through anonymous email distribution.

1. Develop the Research Question: The research question is derived by a number of ways. For example, it might be co-developed by the student with the help of the supervisor, or the researcher’s own industry experience often contributes to his interest in the research area. A review of the literature is also conducted, among other things, to determine if a theoretical gap exists. Often pilot studies are undertaken for numerous reasons: i) identify the problem, ii) conceptualize the study, iii) design the study, iv) develop the sample, v) refine the research instrument, and, vi) develop and test data analysis techniques. Completing a pilot study can also help ascertain the relevance the research question has to industry. (Skulmoski, Hartman, & Krahn, 2007, p. 3)

Researcher's application: A review of the literature was conducted and a void was discovered with regard to metrics for AAU performance and measures from which to conduct an analysis. The Author's own experience, with 6.5 years enlisted maintenance in the ANG, as a traditional Guardsman and a full-time Air Reserve Technician, plus having been attached to a Reserve C-130 flying squadron for 2.5 years of his 13 years on AD, definitely contributed to the author's interest in this subject. No formal pilot study was done, although one could reasonably argue this research is itself a pilot study. The determination for which measures to use regarding how AAUs are actually performing, relative to baseline expectations and strictly active duty units, could follow the outcome of this research.

2. Design the Research: After developing a feasible research question, we begin designing the research from a macro to a micro perspective. Typically we review different research methods (both qualitative and quantitative) and after considering the pros and cons of each, we select the most promising method(s) to help answer our research question. The researcher would select the Delphi method when he wants to collect the judgments of experts in a group decision making setting. Both qualitative and quantitative methods can be used in the Delphi process. The Delphi method may be only one component of the research project; for example, the Delphi outputs may be verified and generalized with a survey. (Skulmoski, Hartman, & Krahn, 2007, p. 3)

Researchers Application: The researcher consciously chose the Delphi method because quantifiable data was unavailable to perform analysis or comparison with and appropriate metrics hadn't been established for this complex issue. Judgment of SMEs is an appropriate starting point to determine these metrics. Subsequent analysis should be able to draw from this research and derive accurate measures with suitable variables. As alluded to in the previous step, this Delphi study may develop findings that can be used for a later research.

3. Research Sample: Selecting research participants is a critical component of Delphi research since it is their expert opinions upon which the output of the Delphi is based. There are four requirements for “expertise”: i) knowledge and experience with the issues under investigation; ii) capacity and willingness to participate; iii) sufficient time to participate in the Delphi; and, iv) effective communication skills. Since expert opinion is sought, a purposive sample is necessary where people are selected not to represent the general population, rather their expert ability to answer the research questions. The student may need help from the supervisor to identify the initial group of experts but may use the "snowball" sampling technique to generate subsequent participants. (Skulmoski, Hartman, & Krahn, 2007, p. 3)

Researchers Application: In the selection of the Delphi Member panel, the author sought those with leadership experience in AAUs who have also served in strictly AD units. This provides a pool large enough to address different unit types (e.g. C-130 and KC-135 aircraft units, ANG or AFRC host base, Director of Operations and Squadron or Group Commander backgrounds). The author deliberately chose a cross section of these backgrounds and intentionally did not request participation from all people within these demographics ensuring anonymity to be at the discretion of the Delphi member. As for the four requirements, the author believes he has succeeded in selecting enough members with all of those qualifications, allowing for the fact that some participants will likely not complete all rounds for various reasons, despite their desire to do so.

4. Develop Delphi Round One Questionnaire: Care and attention needs to be devoted to developing the initial broad question, which is the focus of the Delphi, because if respondents do not understand the question, they may provide inappropriate answers and/or become frustrated. Sometimes, the purpose of the first round Delphi is to brainstorm. (Skulmoski, Hartman, & Krahn, 2007, p. 4)

Researchers Application: The first round questionnaire had multiple revisions coordinated with the researcher's advisor based on what was learned during the literature review. The questions are still in line with brainstorming, but the likelihood of receiving unintended responses will hopefully be reduced and the participant's time not wasted. One of the primary purposes of this research is to prevent staff workers from compiling superfluous data.

5. Delphi Pilot Study: A pilot study is sometimes conducted with the goals of testing and adjusting the Delphi questionnaire to improve comprehension, and to work out any procedural problems. The researcher may also pre-test each subsequent questionnaire. The Delphi pilot is especially important for inexperienced researchers who may be overly ambitious regarding the scope of their research or underestimate the time it will take a Delphi research participant to fully respond to the Delphi survey. (Skulmoski, Hartman, & Krahn, 2007, p. 4)

Researchers Application: The author will use the pre-test option for this step in the Delphi process. He will ask peers to review the questions for clarity and accuracy. A pilot study will not be accomplished due to time constraints and a small participant pool.

6. Release and Analyze Round One Questionnaires: The questionnaires are distributed to the Delphi participants, who complete and return them to the researcher. The results of Round One are then analyzed according to the research paradigm (e.g. qualitative coding or statistical summarizing into medians plus upper and lower quartiles). (Skulmoski, Hartman, & Krahn, 2007, p. 4)

Researchers Application: Round One for this study will ask the participants to brainstorm and list the benefits and drawbacks for AAUs that they have experienced or observed. This will be done via an electronic document and distributed via email. Participants data returned will need to be qualitatively coded as described above. The author will delineate benefits from drawbacks and consolidate like responses into one topic or title. Following round

one there should be a substantial list of benefits and drawbacks. Where participants provide long descriptions the researcher will attempt to minimize the wording into a clear concept using a shortened description for ratings in round two.

7. Develop Round Two Questionnaire: The Round One responses are the basis with which to develop the questions in the Round Two Questionnaire. Depending upon the research goals, the researcher may direct the focus of the research, or be directed by the opinions of the participants. If the purpose of Round One was to generate a list, then it is common to pare down that list in Round Two. (Skulmoski, Hartman, & Krahn, 2007, p. 4)

Researchers Application: From the lists of benefits and drawbacks compiled in Round One, the author will ask three questions for each benefit and each drawback. They will seek the participant's level of agreement that each benefit and drawback, provided by a member of the Delphi panel; a) is important for AMC to track and monitor, b) affects the capability of AMC, and c) is an appropriate factor to compare between AAUs and strictly AD units. This will be conducted using electronic spreadsheets and delivered anonymously via e-mail.

8. Release and Analyze Round Two Questionnaires: The Round Two Questionnaire is released to the research participants and when completed, returned for analysis. However, the participants are first given the opportunity to verify that the Round One responses did indeed reflect their opinions and are given the opportunity to change or expand their Round One responses now that the other research participant's answers are shared with them. Ranking and rating the output of the first round is common. Continuous verification throughout the Delphi process is critical to improve the reliability of the results and should be factored into the research design. Again, a similar process of analysis is often used in Round Two. (Skulmoski, Hartman, & Krahn, 2007, p. 4)

Researchers Application: The round two responses will be compiled into a master spreadsheet for analysis of ratings and comments. Looking at all three questions for each topic independently, the researcher will average the responses from round two and determine if a) a

mathematical consensus was reached and b) if a homogeneous consensus was reached. The researcher will use the average for each topic to determine if the group has achieved consensus for either and or both mathematical and homogeneous levels of agreement. Mathematical consensus will be a numerical average of ratings equal to or greater than “4” and a homogenous consensus will be a level of agreement with all participant ratings equal to or greater than “4” for a given topic.

9. Develop Round Three Questionnaires: The Round Two responses are used to develop the Round Three Questionnaire with additional questions to verify the results, to understand the boundaries of the research, and to understand where these results can be extended. Typically, the questions become more focused on the specifics of the research at each round. (Skulmoski, Hartman, & Krahn, 2007, p. 4)

Researchers Application: The intent of the study is to establish where a consensus exists regarding a potential benefit or drawback provided by members of the Delphi team. If consensus is reached on either end of the spectrum, agreement or disagreement, the topic will not advance to the third round for consideration. However, if a topic achieves or nearly achieves mathematical consensus without homogeneous consensus, those topics will proceed to round three for review to be rated once more. For Round Three, the author will anonymously reveal all Delphi members’ ratings along with the individual participant’s rating; the feedback will include the average value of numerical ratings for the each response provided in Round Two, accompanied with comments for why panel members gave an item its rating. This will be accomplished with consolidated responses on an electronic spreadsheet. In addition, a column will be available for the participant to again rate topics which have not yet achieved

consensus. Items which achieve consensus will not have this option and only results will be revealed to the participants.

10. Release and Analyze Round Three Questionnaires: The final round of analysis is conducted following a similar process used to analyze the data in Rounds One and Two: use the appropriate technique for the question type (e.g. coding for open-ended, qualitative questions). Again, the research participants are given the opportunity to change their answers and to comment on the emerging and collective perspective of the research participants. The process stops if the research question is answered: for example, consensus is reached, theoretical saturation is achieved, or sufficient information has been exchanged. (Skulmoski, Hartman, & Krahn, 2007, p. 5)

Researchers Application: The researcher will follow the procedures established in step eight, analyzing results for mathematical and homogeneous consensus.

11. Verify, Generalize and Document Research Results: The Delphi results are verified (usually continuously through the Delphi) and the extent the results can be generalized are also investigated. (Skulmoski, Hartman, & Krahn, 2007, p. 5)

Researchers Application: By providing participants their individual responses from previous rounds, the author will have done his due diligence in ensuring accuracy and intent of the participants. A disclosure in this document has already stated the opinions expressed in this paper are the authors and do not represent the United States Air Force. The author is available to clarify any procedural questions or assumptions should it be of value to AMC or future researchers.

IV. Results and Analysis

The following chapter is the data gathered for this research. The author was able to accomplish all the steps listed in the previous methodology chapter. The Delphi started with eleven members and finished round three with five. During the course of this study the United States Air Force was required to rapidly respond to two international natural disasters in Haiti and Chile, in addition to surge planning operations for Afghanistan; seven members withdrew because of their need to focus on these responsibilities. The author was prepared for this, as stated earlier in the paper and is why he intentionally included more SMEs than was required to ensure a sufficient number of participants to complete the study and provide credibility to the results.

Round one produced 19 benefits and 16 drawbacks provided by the SMEs which were then organized and consolidated by the author. Round two was the initial round for rating each of these benefits and drawbacks. Following round two the author used the criteria established in chapter three (Methodology) during step eight of the Delphi process; he determined the level of consensus among the participant ratings for each of the three research questions. After the analysis in round two, benefits and drawbacks which had potential for change, for example, a benefit with mathematical consensus, but not homogeneous consensus, was again asked of the Delphi members. All members were provided anonymous visibility of the results from round two; including rationales for why the members rated the item as they did. The information afforded the panel an opportunity to reconsider the question from another view point. This is the strength of the Delphi process, allowing peer review and reflection to achieve a consensus with common perspective, yet avoiding the limitations of group think and peer pressure. Below you will find the three research questions followed by the mathematical results in tables 4.1 (benefits)

and 4.2 (drawbacks). The tables have the benefit listed with the mathematical average for each research question for the given benefit or drawback. The legend explains that a green highlighted number equals both mathematical and homogeneous consensus, yellow equals mathematical consensus without homogeneous consensus, and red equals no mathematical consensus.

Question 1 (B1 and D1)

What benefits and drawbacks of Active Associate Units are important for Air Mobility Command to track for best practices, lessons learned, and trends?

Question 2 (B2 and D2)

What benefits and drawbacks of Active Associate Units impact the capability of Air Mobility Command?

Question 3 (B3 and D3)

What benefits and drawbacks of Active Associate Units are most appropriate for a comparison of Air Mobility Command Active Associate Units and strictly Active Duty Units?

Results

Legend

Green^G = Positive Mathematical Consensus (avg. ≥ 4) **and** Homogeneous Consensus (all ≥ 4)

Yellow^Y = Positive Mathematical Consensus (avg. ≥ 4)

Red^R = Negative Mathematical Consensus (avg. < 4)

Table 4.1 - Analysis of Active Associate Unit Benefits

Benefits		Mean		
		B1	B2	B3
1	AMC gains more Capability through leverage of Reserve/ANG aircraft	6.0 ^G	6.0 ^G	5.6 ^G
2	Active Associate Units flying ARC aircraft should see higher off-station mission reliability rates than AD units	4.6 ^G	4.6 ^G	5.0 ^G
3	Active Associate Units flying ARC aircraft should see higher local training efficiency than AD units (i.e. fewer currency waivers, member's mission ready status, etc...)	4.6 ^G	4.6 ^G	4.6 ^Y
4	Ops and maintenance in the Guard and Reserves have been observed by active duty to have a better working relationship leading to better efficiency	4.0 ^Y	4.2 ^Y	4.0 ^Y
5	After initial stand-up costs, the O&M budget for an AAU would be less than an equivalent (personnel, aircraft and infrastructure) unit added to an existing AD base	4.4 ^Y	4.6 ^Y	4.2 ^Y
6	AMC saves manpower when AAUs are established on Guard and Reserve bases versus AD bases because they can leverage host ARC unit administrative support without assigning AD admin support to ARC bases	4.6 ^Y	5.2 ^G	4.8 ^Y
7	AMC saves costs by creating an AAU versus adding equivalent personnel, aircraft and infrastructure to an existing AD base	4.8 ^G	5.2 ^G	4.4 ^G
8	Active associate units allow flexibility for AMC in absorbing more pilots in the event the Air Force needed to rapidly increase the number of student pilots graduating UPT (this question deals with how many pilots (constraining position for training requirements) an ops units can make into A/Cs with available training and experience)	5.4 ^G	5.0 ^G	4.0 ^Y
9	Leveraging the AFRC and ANG experience creates more well developed aviators for AMC	4.8 ^G	5.2 ^G	5.0 ^G
10	Active associate units provide benefit to AMC training/grooming of young maintainers (e.g. time to upgrade skill level)	4.8 ^G	4.8 ^G	4.4 ^Y
11	Active Associate Units provide more command opportunities for active duty personnel and provide AMC and the Air Force more qualified senior leaders	5.2 ^Y	4.2 ^Y	2.8 ^R
12	Able to surge greater number of active duty to ongoing contingencies without activating Guard or Reserves	4.8 ^Y	3.8 ^R	3.6 ^R
13	Active Associate Units are a great way to develop airmen; educates active duty personnel what ANG and AFRC units do for MAF capability, enabling effective Total Force Integration Education/Developing Airmen in Total Force Integration	4.6 ^Y	4.6 ^Y	4.4 ^Y
14	There are bonds being created that will foster some dynamic interactions in the future. In a future budget crunch, the AD and ARC may be a bit more willing to concede issues...if they know that the ARC or AD person and they trust they are not hoodwinking them. Relationship building for the Future Total Force	4.6 ^Y	5.0 ^Y	4.2 ^Y
15	Assuming the active component is provided required access to aircraft, the cost of the unit will be lower than an all active duty unit	4.8 ^G	5.0 ^G	5.2 ^G
16	If the active component is at a host Guard or Reserve base the overall cost (manpower, BOS, facilities, etc...)for a given Unit Task Code is lower	4.8 ^G	4.4 ^Y	4.8 ^G
17	With Guard/Reserves collocated there is a better opportunity for traditional Guard/Reservists to volunteer; alleviates active duty deployments	5.0 ^Y	5.2 ^G	4.8 ^G
18	Provides opportunity for active duty looking to transition to the Guard or Reserves; supports this important component of the Mobility Air Force	4.0 ^Y	3.8 ^R	3.8 ^R

19	ARC units bid for and provide opportunities to expand AD crews breath of knowledge, see new missions, different world-wide locations; beyond the AOR and local training, untraditional Off Station Trainers, Exercises, non-combat missions	5.0 ^Y	4.2 ^Y	3.4 ^Y
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Table 4.2 - Analysis of Active Associate Unit Drawbacks

Drawbacks		Mean		
		D1	D2	D3
1	Unresolved cultural differences between host unit and active duty will limit the benefit of the host units more experienced workforce for active duty	4.4 ^G	3.4 ^R	2.0 ^R
2	There is potential for actual negative impact to an active duty career; shortage of supervisor position, wing level positions, out of sight and geographically separated from ADCON base (segmented by rank category)	N/A	N/A	N/A
2.1	There is potential for actual negative impacts to an active duty field grade officer's career	3.8 ^R	3.8 ^R	4.6 ^Y
2.2	There is potential for actual negative impacts on active duty company grade officer's career	3.4 ^R	3.3 ^R	4.4 ^Y
2.3	There is potential for actual negative impacts on an active duty Senior NCO's career	4.0 ^Y	3.5 ^R	4.8 ^G
2.4	There is potential for actual negative impacts on an active duty NCO's career	4.2 ^Y	3.0 ^R	4.4 ^Y
2.5	There is potential for actual negative impacts on an active duty Airman's career	2.6 ^R	2.5 ^R	3.4 ^R
3	If left unaddressed perceived negative impacts on active duty Personnel's career could create a cultural rift between those who have served in active associate units and those who have not	3.6 ^R	3.8 ^R	4.2 ^Y
4	The state issues with each guard unit (no problem with reserves) not connected to active duty makes communication difficult	3.8 ^R	3.0 ^R	2.8 ^R
5	There is potential for a lack of fairness in the awards and decorations for active duty personnel stationed at active associate units	5.0 ^G	3.6 ^R	4.4 ^Y
6	Increased demand of host unit aircraft could drive ARC traditional reservists to separate for lack of flying. Subsequent Lack of man days at an AAU caused by Active duty personnel performing these missions could cause host members to separate and seek other opportunities for better pay	2.8 ^R	3.6 ^R	2.6 ^R
7	Tasking Difficulties; If active duty unit doesn't have a lead Unit Type Code (UTC), the unit cannot be tasked without another unit able to meet that requirement	4.4 ^Y	4.0 ^Y	3.0 ^R
8	Poor weather conditions of host unit location could reduce the effectiveness of an active duty unit located there	2.2 ^R	1.6 ^R	2.8 ^R
9	Single shift maintenance is a constraint for ARC units and requires AD units accept less desirable shifts if 2 or 3 shift Mx is required	4.0 ^Y	4.0 ^Y	4.2 ^Y
10	Host unit deployment standards (30-60 days) being less than active duty standards (90-120) decreases the effectiveness of AMC capability	2.8 ^R	2.2 ^R	3.4 ^R
11	If the active component is not provided required access to aircraft the cost of the unit will be higher as not all members will be used efficiently as at an all active duty unit	3.8 ^R	3.4 ^R	3.8 ^R
12	During periods host unit mobilization, fewer aircraft are available. For AD AAU to train and retain MR status. (crews available but with very limited number of aircraft to fly)	4.6 ^Y	4.2 ^Y	3.6 ^R
13	There is a higher ops tempo for active associate units than equivalent units at strictly active duty bases	3.0 ^R	3.6 ^R	4.2 ^Y

14	As ADCON leadership rotates there is a lack of understanding for those not in active associate units regarding the command authority and chains on command	5.0 ^G	4.4 ^Y	3.6 ^R
15	There will be a loss of active duty culture and values among those in active associate units	2.0 ^R	2.8 ^R	3.4 ^R
16	Tasking flexibility, the aircraft belonging to ARC means TACC has to coordinate with ARC	1.6 ^R	3.6 ^R	3.4 ^R

Analysis

The usefulness of this research is more likely to be found in the rationales provided by the members of the Delphi panel. While not all members were able to complete the full three rounds of the study, their expert opinions are still valid and were useful in providing insight for the numerical values which were ultimately derived. Below the author will analyze the findings provided by the panel members and provide applicable comments present by the Delphi members. It is important for the reader to remember each of these benefits and drawbacks is being analyzed independently and may not have consideration for second and third order effects.

BENEFITS

1. AMC gains more capability through leverage of ARC aircraft
 - The data clearly indicate AMC should track how much capability, in terms of aircraft, AAUs provided AMC. This confirms one of the generally intended benefits of AAUs is also believed to be important by those fulfilling the mission.
 - In terms of capability, one participant commented, “the AD has increased capability without mobilization.” The number of aircraft assets now available to AD has increased for both C-130s and KC-135s.
2. Active Associate Units flying ARC aircraft should see higher off-station mission reliability rates than AD units
 - This benefit had a high level of agreement. One participant commented that, “Their UTE rates are much lower than AD units so they have more time to fix their planes. It would be useful though, to measure the impact that associations have on ARC Mx units; whether or not their metrics go up or down.” Another comment stated, “I agree that they

have a very slight advantage on reliability rate; although that may not translate to MC rates.” The data show this is worth tracking.

- In terms of impacting AMCs capability one comment stated, “Newer [and] lower hour aircraft have better availability and higher UTE rate for deployments and other missions.” This benefit clearly impacts the capability of AMC.
 - The question of whether or not this is a viable metric between AD and AAUs is answered with this comment, “Data may show a need to send certain skill levels to active associates if reliability is consistently low at active associate bases.” In comparing between the ARC and AD it may be wise to consider a way to determine a metric for the unit’s effectiveness relative to experience level; looking at an aggregate total of number of personnel with respect to skill level/experience and aircraft reliability.
 - The author, in speaking with some of the Delphi members on this subject, heard multiple comments wondering about the long term impact of AD flying ARC aircraft. This benefit initially included a statement that ARC units had better maintenance practices, however, that was sharply critiqued by multiple members in round two. The indication was that the ARC did not have “better practices,” but rather more experience, less demand on the aircraft, and newer aircraft, in the case of the C-130, which account for their better metrics. As stated previously, it would be beneficial to discover if ARC units are “better” or if they simply have a better environment, causal to the higher metrics.
3. Active Associate Units flying ARC aircraft should see higher local training efficiency than AD units (i.e. fewer currency waivers, member’s mission ready status, etc...)

This is very similar to the previous question. The author broke this original benefit into two sections; off-station and local flying, to determine if there would be any noticeable differences in ratings among participants. The data shows only a very minor difference in favor of off-station importance with both reaching consensus for all three questions.

- Based on the statement above, one comment provided is also applicable to benefit #2. “The [ARC's] "pride in ownership" is striking when compared to AD lack thereof. The maintenance practices are the same but the [ARC] seems to have the extra time and energy, because they possess the aircraft, ["pride of ownership"] is missing on AD now.” Although the KC-135 aircraft are not really older in the AD than the ARC, as is the case with the C-130, they do have fewer hours and the KC-135 SMEs agree the aircraft are in better condition and appear to have better reliability; this is worth tracking.

- One participant commented with strong agreement to track this, “Associate UTE rates will go up (by design) and MC rate will likely go down [in AAUs]. We have single shift [maintenance], which means if an aircraft breaks on an evening line or a Friday, it sits. I have lost a lot of lines for [maintenance].” This comment brings the previous research done by the RAND Corp. into play. The F-16 AAU RAND studied looked at what levels of utilization which would require an increase to a second shift of maintenance and the added costs associated. This is worthy of further research to determine when a second maintenance shift is required. Some consideration would be needed to determine if the study should be done evaluating with the same criteria across all C-130 and KC-135 AAUs, or each base independently. The later, would likely be more time intensive upfront, but with a proper model, it is seems the better avenue to take for implementing a successful solution, as each AAU has different variables to consider.
 - There was one comment highlighting the benefit to AMC’s capability by spreading out the usage of aircraft. “Using ARC iron to train AD crews is a good move. Spreads the iron burn rate out evenly across the...community so the fleet[s] age at the same rate.” This technique is used in some airlines; flying aircraft on different routes to balance the fatigue and stress points of the planes.
 - This question saw a clear divide between C-130 and KC-135 participants. C-130s saw this as a useful measure between AAUs and AD units. KC-135 participants were border-line on agreement. This may be attributed to the more homogeneous age and hours of the aircraft. The author has concluded, based on a comment from one of the panel members, this metric is equally important for the ARC to track as those units are the ones which are likely to see a decrease in reliability caused by the AAU increasing their UTE rates. The comment stated, “Comparison also needs to look at strictly ARC units too to see how associations affect the ARC.”
4. Ops and maintenance in the Guard and Reserves have been observed by active duty to have a better working relationship leading to better efficiency
- The numerical data show this is not something to be tracked. With that said, there are a majority of respondents who provided observations such as the following, “These guys know each other, work together, live together, and, in some cases, are related. They have strong ties, through these long term relationships, that establish constant communication. They trust each other in a way that does not exist on AD because of all the PCS.” Based on his own experience as a previous maintenance technician in the ANG, the author concurs with this sentiment. The constraint appears to be the turnover. If this issue

proves to be a factor in better maintenance practices, consideration needs to be given to means of improving the Espirt-de-corp of AD maintenance units.

- Although no consensus was achieved, there is data suggesting in the selection of a host ARC unit, it would be wise to observe the working relationship between the host operations and maintenance organizations. Personal conversations with some of these panel members tied a strong link between the success or at least decreased number of challenges for association and the quality of the relationships formed with the host. The comment stated "...better relationships [with] host unit facilitates more aircraft mission capable. All unit members--ops and mx--take better care of aircraft because they feel the aircraft belong to them. If they break them, they won't be able to fly them." On the contrary, a possible negative effect of the close relationship could be experienced under different circumstances. If the environment for the ARC is in fact the real cause for their better metrics, then AAUs could drive this down. If that were to happen the need to push maintenance for more productivity may be required. However, one SME made the following comment, "Ops is less likely to push [maintenance] for efficiency because of personal relationships." His argument being, it's easy to get along when there is no stress. How [operations] and [maintenance] relationships in the ARC hold up under higher UTE rates has yet to be recorded.
5. After initial stand-up costs, the O&M budget for an AAU would be less than an equivalent (personnel, aircraft and infrastructure) unit added to an existing AD base
- With one exception this received high agreement. The one individual who rated this "Largely Disagree" did so based on the opinion that it wasn't measureable. The remainder found this to be a very agreeable benefit of AAUs and worth tracking. The panel member who rated this in the "disagree" range commented, "I believe it will be proportionally the same as AD." The comment is a valid expert opinion, however, the author would argue that it actually supports a position to collect the data and verify the units are "proportionally the same."
 - If AMC is to determine costs for metrics it will require a detailed approach, standardizing terms and clarifying which parts of the budget should be applied. Some considerations AMC could consider are, determine the cost for equivalent AD and AAU UTCs (e.g. two-ship follow UTC, meaning two aircraft and personnel deploy in support of a lead organization). From that determination, measure the cost for each AAU relative to the AD. The decision determining which portions of budgeted money are sunk costs and which are variables, common and appropriate, among AAUs and AD units with the same missions, will likely happen in the A8 directorate with help from other tasked directorates with specialized knowledge. One participant provided the following opinion, "personnel

costs are a wash because you would still be paying [them] whether at a TFI unit or a traditional AD base.” This person is assuming an equivalent total number of personnel are to be used so where they live is rather minor. Another participant comment would need to be clarified. He stated, “Most active associates rely on a nearby AD wing for MPF-type support as well as the Parent Wing for ADCON support. The manpower is still required; it's just located somewhere else.” If this is true, A8 needs to determine, through appropriate directorates, how budgets were changed as a result of the AAU. Did a servicing MPF or other support organization receive added funds to support the new AAU? If so, it would seem appropriate to include that in the cost of the AAU and any other new monetary costs imposed as a result of the AAU. If units supporting the AAU are being asked to do more with less, that may be viewed as no cost added, however, a study should be considered on what impact providing new service without new funds or manpower has on those support organizations from pre to post implementation.

6. AMC saves manpower when AAUs are established on Guard and Reserve bases versus AD bases because they can leverage host ARC unit administrative support without assigning AD admin support to ARC bases
 - With one exception, all the Delphi members believed this is a benefit that should be tracked and all agree it impacts the capability of AMC. The author would again argue the comment provided is valid, but stands to give further support in favor of tracking this information. The comment stated, “[It] depends on [your] perspective. AMC/A4 argues that they are taking associate personnel out of hide. If end strength is the same, those "left" at AD bases are doing more with less [and] manpower is unchanged.
 - Another comment, unchanged from round two to three, believed this was a benefit and worth tracking based on the following statement, “Units are already operating with ARC manning--AD simply blends into the wing structure. We 'piggy back' on ops [maintenance] support, thus the AD don't require full manning levels of AD support.”
 - The same general argument is made that with regard to manpower the members with all but one exception believe this impacts the capability of AMC, however, they all seem to agree with the comment seen here, “Current TFI units are on or near other active duty bases (FE Warren, Peterson, Keesler, etc). AMC may not be paying the bill (AFGSC, AFSC) but AD is.”
 - The same participant who felt this was an appropriate metric to compare between AD and AAUs made the following comment, “[there is] less of a bill to AMC if support base is in another MAJCOM -- still an Air Force bill.” This seems to indicate that AMC can claim

savings for some AAUs but it may have to consider the bigger picture for those “savings.”

- The bottom line on this topic requires further clarification of what “extra” manpower is. The author has concluded the members of this panel view any manpower support provided by the host without additional money budgeted to them is savings for AMC.
7. AMC saves costs by creating an AAUs versus adding equivalent personnel, aircraft and infrastructure to an existing AD base
- One comment believed this was a true benefit worth tracking based on the following condition, “As long as the AD and ARC personnel integrate their shops/processes.”
 - A different participant commented the, “Some infrastructure costs are shared, but intention of this relationship is to have the bulk of infrastructure costs paid by host units.” While this may be true and could represent a cost savings to AMC, the question then needs to be addressed, how is that expectation met if AMC doesn’t provide a perceived fair share, the relationship is likely to suffer. A different SME commented in this support of this sentiment, “the AD does have to provide initial investment and must be committed to sustainment dollars to ensure TFI success.” From what the author has heard, some AAUs are contributing more to the facilities and budget than others. It seems each unit needs to be addressed individually in this regard.
 - This next comment is an example of what AMC needs to consider, because the SMEs do believe this is a potentially big benefit, but how to define it is something AMC will need to decide. For example, “[some] ARC units operate on 2-shift [maintenance versus] the 24/7 of a typical AD unit, so there is some savings in facility usage, but AD isn’t paid by the hour.” How does AMC compare an AAU on a single or two-shift schedule with an AD unit on 24 hour operations?
8. Active associate units allow flexibility for AMC in absorbing more pilots in the event the Air Force needed to rapidly increase the number of student pilots graduating UPT
- One individual the author spoke with on the phone commented they believed the benefit of “access to more aircraft” was seen more in home station training efficiency. The poor maintenance reliability, for the C-130 specifically, currently seen on AD bases has apparently made keeping crews fully trained a greater challenge. This is not the case at AAUs that are FOC. It is important to note, the association at Pope AFB has had challenges not experienced by other AAUs. They did not associate with an established unit. Rather their “host” had stood up at Pope AFB, NC after moving from Milwaukee

WI. The host unit has had challenges manning the unit since the move. Their situation should not be considered with regard to the previous statement. The inverse is actually true for that location.

- A key assumption here is that commanders will not certify an Instructor in any crew position unless they are capable of performing the mission. The overwhelmingly higher level of experience in the ARC cannot be effectively contested. The consensus of the Delphi members is so strongly in agreement, quotes are not need beyond that comment. Of note however, is one comment which points out the following, "...only if the assumption is [AAUs are] new squadrons that would not otherwise exist. Another option is annexing ARC aircraft and building new squadrons on active duty which would negate this TFI benefit." If AMC were to increase its total number of aircraft and has the capacity to certify more effective and qualified Instructors in numbers equal to the ARC, this comment is true. It should be noted the participant rated this in maximum agreement and appears simply to have provided this as a devil's advocate position.

9. Leveraging the AFRC and ANG experience creates more well developed aviators for AMC

- There is total consensus that the ARC provides a great benefit to AMC with regard to experience. However, there were two applicable comments with some foresight indicating this may not be an enduring benefit. "[It's] a benefit for now, but much of the ARC is reaching retirement age. Some units are getting just as young as AD," and the second comment, "[I] concur with the aging of the ANG. [A] huge turnover is coming over the next 5-10 years. AD may actually provide the stability in associate units [in the future]. These two comments provide sound reason to track this information. If AMC values this information, one potential method is to work with Host Aviation Resource Management (HARM) offices to acquire the flight hours for all MR crew members in all units and track trends for average hours per crewmember on AD and ARC units.

10. Active associate units provide benefit to AMC training/grooming of young maintainers (e.g. time to upgrade skill level)

- One SME said using the ARC to train young AD maintainers was a plus up for capability on the AD side seen here, "Using ARC 7-levels to train AD 3-levels will free up AD 5/7-levels to deploy and run AD [maintenance] units."
- Two participants comment that they had not seen benefit of direct ARC to AD training of maintenance personnel. With that said they still believe being around the ARC was a good experience for development. In what appears to be a response to those two

comments a third member stated the following, “It appears each unit is different. If [masked variable for anonymity] is driving manning, perhaps it should factor into where AAU's are built. I believe seasoning young maintenance folks is a critical benefit to AAU's. The author masked the variable because it could break the anonymity of the participant. If variables are preventing a certain skill set from being assigned to an AAU then AMC needs to evaluate, given that constraint, is the AAU going to the “right” location. If not they need to inform higher authority for possible changes to the location.

11. Active Associate Units provide more command opportunities for active duty personnel and provide AMC and the Air Force more qualified senior leaders

- Overall the consensus was this is a benefit, important to monitor. The author discovered from conversations with Delphi members, AAU commanders have different , not harder challenges and it is very important to monitor this fact and ensure the “right” person is sent to the AAUs for command. These commands are very relationship dependent and a strong understanding of TFI and ARC operations is important for success.
- The same participant, who commented that absorption is only a benefit of AAUs if AD was not going to otherwise increase its number of squadrons on AD bases, provided the same comment for this benefit.
- All but one participant commented they believed this fact, “six new units = six new commands,” is a benefit. The counterpoint was that while these new commands may be beneficial to those in them, and increases the number of experienced leaders AMC has for future use, those who serve under them have to hope their new commanders are strong leaders, “Active Associate Units also geographically separate young officers from their senior leaders thus could pay a [penalty for being in an] Active Associate [Unit]. Wing commanders may not want to give a Definitely Promote (DP) push for a guy he or she has never seen thus putting the burden on the squadron commander to "sell" their people to the parent Wing commander.”

12. Able to surge greater number of active duty to ongoing contingencies without activating Guard or Reserves

- This question should have been broken into two segments, one for personnel surges and one for aircraft surges. With that said, all but one participant rated this benefit in agreement that it is an important benefit. The one who rated this in the “disagree” range stated the following, “The number of AD personnel does not change just because they have moved from an AD base to a TFI unit. Mobilization (as seen in the C-5/C-17

community) is still going to occur because of the lack of personnel to cement the multiple numbers of contingency operations throughout the world.” It is clear this person rated this in terms of personnel. Due to time constraint the researcher is unable to further clarify this response among the other participants. Another member had a different opinion of the same idea for personnel. He commented, “[It’s a] double edge sword, the Combatant Commander (COCOM) will have more crews but not a significant increase in tails. These associate units provide more crews to the fight, [but] very [few] tails [relative to the number of crews available]. For example, three C-130 AAUs only have 2 tails in theater, but are capable [of] providing 12, 16, and 12 combat ready crews if needed.” The author, upon reflection, sees this last statement as support for AAUs having the capability of providing AMC the ability to surge with ARC aircraft and AD crews, if needed. The legality and ability of AMC gaining access to more than two aircraft at a time for surge periods of operations is not known to the researcher. If this is an option, it clearly demonstrates an important benefit impacting AMC’s capability.

- The third question relating to whether or not this is a suitable benefit to compare between AAUs and AD units doesn’t work well here. One participant commented, “Without TFI this question is not applicable, [I] don't see how this is relevant.”

13. Active Associate Units are a great way to develop airmen; educates active duty personnel what ANG and AFRC units do for MAF capability, enabling effective Total Force Integration Education/Developing Airmen in Total Force Integration

- There were four members of the panel who rated this very high. One member however, did not agree. His primary concern was with how to measure this benefit. It is not clear if he believes it is a benefit, but his ratings clearly indicate he does not value this as a data point to be tracked, primarily because he doesn’t know how this can be done. The author see his point, however, that challenge removed, the four remaining participants clearly view the education received by AD airmen, in all positions, as invaluable. The author, upon reviewing all the comments is left wondering, does the Air Force have a metric for the value of Professional Military Education (PME)? This is a benefit within the Air Force without metrics to support their enduring use. Perhaps the Air Force should ensure future AAU commanders have had a previous position within an AAU. That would be a potential reason for tracking this data and explaining the benefit of the education received here.
- One participant who rated this with high agreement, commented, “As long as the AF continues with TFI as the future of the AF, if a new Chief [of the Air Force] comes in and decides to stop it all, this will be a drawback.” That is important to understand and appreciate.

14. There are bonds being created that will foster some dynamic interactions in the future. In a future budget crunch, the AD and ARC may be a bit more willing to concede issues...if they know that the ARC or AD person and they trust they are not hoodwinking them. Relationship building for the Future Total Force
- There is a very strong consensus among four of the five participants. Two different participants rated this in the disagree range; they did so based on this being too difficult to measure. They seem to believe it is a benefit, but how do you measure it.
 - Here are just two ratings demonstrating the overwhelming agreement to this benefit. “If I could rate this higher than “6” then I would. His comment stated, “The second and third order effects of the TFI unit will be realized when the younger troops start making their way into decision making or support or SME roles. They will completely change the Top Down view of AD with regard to what the ARC brings to any/all arenas.” The other says, “Without STRONG relationships between all leadership, nothing can be accomplished. This relationship is a two-way street. Expect the ARC unit to acquiesce on some issues, but the AD must also be ready to not only 'give-in' but also take lead on many issues.” Both highlight the benefit of relationships and if fostered could be of real value in the future as budgets shrink.
15. Assuming the active component is provided required access to aircraft, the cost of the unit will be lower than an all active duty unit
- This was believed to be important, affecting the capability of AMC a metric with regard to cost per flying hour between AD and a comparable AAU. The best comment describing this benefit states, “AD doesn't have to procure additional aircraft or equipment to gain additional capability realized by utilization of ARC aircraft. [In addition], shared flying hour programs decrease overall costs.”
 - A means of ensuring this success came from working together well, “flight crews were integrated, and no training requirement was considered more or less important because of the aircrew member's component--all were stratified by importance to keep the unit current/qualified. All flying hours cost the same.” This helped ensure all parties were vested in the success of the units, both the host and associate.
16. If the active component is at a host Guard or Reserve base the overall cost (manpower, BOS, facilities, etc...) for a given Unit Task Code is lower

- The following is only one person's comment, no other participants were this clear in their explanation, "AD shares ALL costs of operations with host unit. Aside from office supplies and TDY, all costs are shared--deployed UTC is outfitted by host unit with reimbursement from AMC for expendables. AMC's cost is lower for an AD associate unit than a pure AD unit." If this is true for all units it is absolutely a benefit affecting the capability of AMC and a worthy metric to compare with AD.
- The counterpoint for consideration was provided by a member who rated this in the "agree" range, but felt it was important to ensure the following in any metric, "[You] need to make sure the overall cost includes [appropriate] support provided by the nearby AD Support Wing and the Parent Wing. The author would add that this is true primarily if additional costs are levied on them as a result of supporting the AAU.
- One more comment supporting this benefit stated, "Personnel cost will remain the same. However, equipment UTC costs should reduce since the AD TFI unit does not own and therefore does not sustain." Not having to sustain the equipment may be the key figure in why an AAU UTC is less expensive than an AD equivalent UTC.

17. With Guard/Reserves collocated there is a better opportunity for traditional Guard/Reservists to volunteer; alleviates active duty deployments

- One participant provided a lengthy comment clearly advocating the benefits gained in terms of volunteerism from AAUs. "Regularly scheduled deployments that fit into ARC members' schedules greatly increase numbers of volunteers. My unit deployed one ARC member for every three AD members! Sometimes, the ratio was one to one! Volunteers were not limited to only those from my host unit--word was on the street of schedules and requirements for needed crew positions. AD units were not flexible enough to allow for 'normal' ARC volunteers--if they couldn't provide 120 days, they weren't allowed to deploy." Providing flexibility greatly helps in the ARC, as the traditional service members often have civilian jobs they cannot be away from for more than 60 days. It may be worth a test, where an AD unit offers ARC crewmembers the opportunity to deploy with AD crews for half rotations (e.g. 60 days). If this is accepted, something like a central booking agent for volunteerism from the ARC could be considered, offering crewmembers to any AD units needing personnel for 60 day periods scheduled and synchronized with the ARC booking agent. This could alleviate some of the deployment requirements for AD personnel while grooming some of the younger ARC members.
- A Delphi member commented that assuming the AD is not going to create new AD units it may be a benefit, but that a "reserve association provides more volunteerism than an Active association." The author does not have any other data to show what the cost

would be to create new AD units with reserve associations, but this seem contrary to the current direction of the Air Force with respect to TFI, and volunteerism is merely an unplanned benefit. The same member commented, “[It] would be interesting to see volunteerism rates at [ARC units] with associations [versus] non-associated.

18. Provides opportunity for active duty looking to transition to the Guard or Reserves; supports this important component of the mobility Air Force

- This question was somewhat unfair in retrospect. It asked members to rate the impact as it relates to AMC, however the benefit identifies the “important component of the larger Mobility Air Force, comprised of all three elements AD, ANG, and AFRC.
- Understanding the authors point above the ratings did not achieve a homogeneous consensus. However, there was useful information provided. With respect to the research questions and the benefits relating to AMC, the following participant seems correct, “This benefits the individual looking to Palace Chase, not AMC.” However, AMC works very closely with the ARC, and is lead for many of their operational directives and instructions. So it is important for AMC to see the mutual benefit in AAUs.” The rest of the comments are similar to the following one, “I had members transition to ANG positions at our host unit...This allowed the members to continue to serve in the military and kept our ARC strong/qualified to fight.”

19. ARC unit bid for and provide opportunities to expand AD crews breath of knowledge, see new missions, different world-wide locations; beyond the AOR and local training, untraditional Off Station Trainers, Exercises, non-combat missions

- One participant comment this is not a good metric to compare between AD and AAU because, “[you] can’t compare, if AD is not doing it.” The author believes it is true that performance for a given opportunity cannot be measured, however, the volume of different missions could be. “AD members in an associate unit have the opportunity to fly more different mission sets than AD only units. One participants concurs with the authors statement with the following, “Instead of OIF/OEF and training, [AAU] members fly Tanker Airlift Control Center (TACC) missions, Joint Army/Air Force Training (JAATs), Special Assignment Airlift Missions (SAAMs), [other] specialized missions and relief missions.” All participants clearly see this as an important benefit for AMC to keep an eye on. It may be possible for A3O directorates to track how many different types of off-station missions units and crew members see. This would be a useable metric for this benefit.

DRAWBACKS

1. Unresolved cultural differences between host unit and active duty will limit the benefit of the host units more experienced workforce for active duty
 - This issue achieved consensus that it is important to track, but the SMEs do not believe it impacts the capability of AMC or is appropriate for comparing AAUs and AD units. All the comments have some degree of information relating to and highlighting the importance of having good relationships for the AD to capitalize on the benefit of working alongside the more experienced host unit members. One describes it as, “the importance of top-down examples, speedy resolution, of all issues.” Another member made the following statement, “Relationships are EVERYTHING! Bad relationships will prevent everything. Perceptions are reality when working together as AD and ARC.”
 - This is not a good benefit for comparison, one participant’s argument to support his belief states, “Bad relationships are not an indictment of associations, but the leadership involved. Again, this is a personality-based issue that is difficult to measure.” It does support the notion that to maximize benefits of the ARCs experienced workforce, good leadership and relationships are important.
2. There is potential for actual negative impact to an active duty career; shortage of supervisor position, wing level positions, out of sight and geographically separated from ADCON base
 - The purpose for breaking this into categories was to determine if there was a different level of concern for any specific groups. The general consensus is that it is less likely to impact a younger officer or enlisted person than those who are preparing to meet higher level promotion boards, such as Captains going to Major or Senior NCOs, both of which rely heavily on stratification at this juncture of a career. Beyond that factor, the data suggests the greatest potential to hurt a career is for all levels of NCOs stemming from a lack of supervisory positions in the higher ranking ARC enlisted force. It is very common to see ARC Master Sergeants (E-7s) working on the flight; this is not often the case on AD. The AD equivalent is responsible for many young three and five level airmen under their supervision. This is a difficult hurdle to overcome as AD promotions utilize paper records and numbers of airmen supervised is an important factor in their promotion score. Beyond that no real difference is attributable based on category of rank. The participants see this as an important issue, but don’t believe it impacts the capability of AMC. It would be an appropriate measure between AAUs and AD units, for NCOs.

- One comment says it simply, “With ADCON somewhere else, this is true.” Other participants used more words to describe in more detail the drawback. “For this and the other rank categories below, I'd say force development in general is something that needs to be tracked in every unit, but particularly associations where geo-separation and limited supervision opportunities in a rank-heavy ARC unit may hurt folks. But it's up to leadership to find solutions to those potential problems.”
 - Here is one more perspective, “When the leadership responsible for this is from a geographically separated ADCON Wing, reduced visibility leaves the perception that those at AAUs are less likely to receive a number one stratification if any.” This is a situation where if the geographically separated ADCON doesn't find a way to alter this perception with solutions such as, metrics demonstrating fairness or more in-person visits getting to know the individuals to alter the perception, whenever a home station unit receives the stratification the perception will be AAUs are where you go if you don't care about being passed over for promotion. This requires proactive solutions from the ADCON Wing leadership.
3. If left unaddressed, perceived negative impacts on active duty Personnel's career could create a cultural rift between those who have served in active associate units and those who have not
 - The majority of experts do not believe this is a drawback or will become one. For example, “I agree that a perceived negative impact could create a rift. However, what I disagree with is that there is a perceived negative impact already.” Another counter point commented, “Most people I know want to go to an [AAU].”
 4. The state issues with each guard unit (not a problem for AFRC) not connected to active duty makes communication difficult
 - This appears to be an individual unit issue. It is not a problem in AFRC. As for the ANG, the consensus is after initial establishment of connectivity this is not an issue, to track or compare.
 5. There is potential for a lack of fairness in the awards and decorations for active duty personnel stationed at active associate units
 - One member commented, “Means the associate [commander] has to fight that much harder for his folks. This appears to be in reference to a different comment from another member

who stated, “Lack of ‘face time’ and dropdown opportunities exist. Out of sight, out of mind.” Another commented, “The geography is hard for a commander to overcome. They have to believe in the mission and perceive real ownership of those AAUs as ADCON leadership.” There are other comments which reiterate this sentiment but would possibly break the participants’ anonymity and were therefore not quoted.

6. Increased demand of host unit aircraft could drive ARC traditional reservists to separate for lack of flying. Subsequent Lack of man days at an AAU caused by Active duty personnel performing these missions could cause host members to separate and seek other opportunities for better pay
 - This appears to have been an isolated unit because the data is overwhelming against this being a drawback. Furthermore, it is agreed that this would not be an impact to AMC or appropriate for comparing among AAUs and AD units.
7. Tasking Difficulties; If active duty unit doesn't have a lead Unit Type Code (UTC), the unit cannot be tasked without another unit able to meet that requirement
 - In my discussions with a staff officer at AMC, one point was raised about KC-135 AAUs. These aircraft appear to get “picked off” more frequently for missions to locations not already having a lead unit, such as exercises. This makes it very difficult for AMC/A3 to task an AMC AAU host by the ANG without huge lead times. “AMC should consider the impact of building too many follow UTCs and not enough Lead UTCs. It is a manning balance however, so AMC must be made aware of any/all risks as they develop with capability and availability of lead UTCs.” This doesn’t appear to be as much a constraint for C-130 at this time, but could become so under different circumstances after operations in OIF and OEF are reduced. The counter argument to the flexibility of a lead UTC is staffing the unit to that capability. AMC needs to consider if the requirement exists for lead capabilities in AAUs to measure if they have the “right” force structure.
 - This drawback achieved agreement that it is important to AMC and affects its capability; however, it is not an appropriate measure between AD units and AAUs.
8. Poor weather conditions of host unit location could reduce the effectiveness of an active duty unit located there
 - This drawback received resounding disagreement in all categories. The author is under the assumption the presenter of this drawback is highlighting that AMC and HQ/AF may

wish to add weather as a consideration in their selection of AAU locations. One participant comment supports this belief, “[Weather] impacts AD bases just like it does ARC. AMC just has to be smart where it places all its forces to ensure training can be done.”

9. Single shift maintenance is a constraint for ARC units and requires AD units accept less desirable shifts if two or three shift maintenance is required

- One of the Delphi panel members stated the following belief, “as long as units fulfill their training requirements, it doesn't matter how they do it. When ops doesn't get the tails it needs, then [maintenance] has to adjust to meet the requirement. That is true of any unit.” Another panel member didn't seem to think this was a constraint because, “AAU's do not have back-shop manning, so a second or third shift could not fix many things anyway, [they are] built to support UTC follow packages.
- With regard to comparing AAUs and AD units, the SMEs believe it is a “good idea to compare [maintenance] effectiveness.” And in addition, “if there is only one shift of maintenance then it should be measured to ensure AMC is getting what it invested in.”

10. Host unit deployment standards (30-60 days) being less than active duty standards (90-120 days) decreases the effectiveness of AMC capability

- This appears to have been an isolated opinion of a perceived drawback. Comments from both KC-135 and C-130 members disagree for all three research questions that the ARCs shorter deployments cycles are a drawback. One member made the following comment, “90-120 construct is not more efficient. In fact, the time off required following a 90-120 deployment reduces the amount of time an Airman is available.” Furthermore, with regard to comparing for example, days available, another participant made this comment. “This is still a problem with AD since they don't understand how a true ARC member performs his/her duties. They believe deploying in any increment less than 120 days leads to inefficiencies. This thought needs to be eliminated and they (AD) need to understand all help is good help.”

11. If the active component is not provided required access to aircraft the cost of the unit will be higher as not all members will be used efficiently as at an all active duty unit

- Overall this was not an agreed upon drawback, Three comments seemed to key in on the “if” in the stated drawback, the first stated succinctly, “[I] agree with the "if" but if the "if" does not exist, then this is a non-player. Leadership must be committed to granting

access.” Further support, that this should not become an issue, is seen in this statement, “[The] ARC signed off on the CONOPs so I can't see how they cannot provide required access.” The final participant commented, “[The] unlikelihood of the "if" makes this not worth measuring. AD also has home-station efficiency issues with its tails deployed.”

12. During periods host unit mobilization, fewer aircraft are available. For AD AAU to train and retain MR status. (crews available but with very limited number of aircraft to fly)

- The majority of people seem to acknowledge this is a drawback, but something AMC is aware of. One panel member said, “I think AMC leadership would understand this already. After all, if you mobilize AMC gained units to help support the COCOMs, then you inherently understand that the assets can then not be tapped again for AD TFI help. This is why AMC needs to understand that the TFI must deploy under the same construct and at the same time as its host unit.”
- In that same regard another participant stated, this should not be an issue and could be addressed if “AD understood the CONOPS better. They need to understand that the [AAUs] should get credit for deploying in support of their host unit--all for the same commander and objective.”
- The argument was well made that you cannot compare this to AD based on the following comment, “[You] can't compare with AD because AD owns all aircraft so therefore if you task all their planes, then none are left. The same is true for TFI. If you task all the airplanes (mobilization) then of course TFI cannot fly the airplanes that do not exist.” So yes, the SMEs agree, this would be a drawback but not a comparable one.

13. There is a higher ops tempo for active associate units than equivalent units at strictly active duty bases

- Based on individual experiences, at different units, at different stages of implementation, with two aircraft types, responses were all over the board. The only consensus was that this would be a metric comparable between AD units and AAUs.
- Here are two example statements from opposite ends of the spectrum, first “AMC data agrees. This will, eventually, begin to deteriorate the interest in AD associate units...if you don't want to deploy a lot, don't volunteer for an AD associate tour.” The counter point states, “[I've] been in the AMC traditional model and two AAU's, the OPS tempo in my experience has slowed down considerably in the AAU model.”

14. As ADCON leadership rotates there is a lack of understanding for those not in active associate units regarding the command authority and chains on command

- There was very strong agreement that this is an important drawback for AMC to track and resolve. Here are some of those comments, first, “I do not think that anyone, other than those in TFI units and staff [workers], understand operational direction and the convoluted relationships that occur because of TFI (e.g. ADCON, Op Direction, PAS code problems, [etc...]). It can all be learned quickly though.” Next a participant with a solution perspective stated, “AMC needs to be proactive and ensure they utilize experience levels appropriately for this effort” and “[AMC] needs more robust training for leadership in the AD.” Two participants from different locations commented in this manner, “Parent wing ADCON causes a lot of pain.” This refers to understanding the importance of relationships at the AAUs before rushing to action without understanding the consequence of some actions. One AAU commander said it best, “I just tell my guys to have respect for the ARC; we came to their house.”

15. There will be a loss of active duty culture and values among those in active associate units

- The data clearly show this is not a perceived drawback to SMEs of AAUs. The comments are consistent in this manner. They believe it is possible, but it is why they (leadership) were and are there. “This is a possibility...however, it is up to the AD associate commander and AD First Sergeant to ensure this does not happen. Actually, my biggest complaint was that we were eroding the ARC culture and values--they felt they were going 'Active Duty'!” and another commented, “It can happen and probably will if the AAU [Commander] and [Director of Operations] allow it to occur. The benefits of AAUs greatly outweigh this possible drawback.” Finally, one more comment said, “That's a leadership issue to solve/prevent. Culture can just as easily be lost in a non-associated unit [too].” It's up to the leadership; this again highlights how important the “right” people are in these commands.

16. Tasking flexibility, the aircraft belonging to ARC means TACC has to coordinate with ARC

- This drawback was not agreed on as being important, affecting AMCs capability or, a comparable metric between AAUs and AD units. In fact two participants clearly viewed this as benefit, “This is a benefit not a detriment. The extra layer means that TACC must adaptively plan vice using knee jerk reactions to all contingencies. This planning would then reduce the AD members stress from the consistent lack of consistency.” The other comment stated, “This was the relationship and agreement when AD associates were developed. This is part of the give and take to have a healthy relationship and to gain

access to ARC iron. Overall, with the increased capability and utilization of additional iron, TACC should realize an increase in AATS availability.”

V. Discussion

Looking at the General Benefits of Associations

As previously stated, the AF/XPFA Total Force Integration office has posted generally expected benefits for associate units listed on their web site. The following analysis will briefly summarize thoughts provided by the Delphi members which are applicable to those expected benefits.

1. Generates efficiency by sharing resources, reducing duplication of efforts, and in some cases, reduces the number of individuals needed to accomplish a task

The Delphi panel ratings and comments indicate the belief this is being achieved. In the case of the C-130s the two extra aircraft on deployment should equate to relief for AD assets. This assumes the AD is leaving two different aircraft at home when relieved by the ARC assets. The AAU aircraft are in better condition and the AD is in fact receiving access to use these additional airframes, providing improved reliability to the COCOMs in OCOs and with the exception of Pope AFB, the FOC AAUs appear to be providing MR crews with greater efficiency than AD.

2. Provides contingency surge capability

This is true, because the term surge implies there is already a “lead” organization at the deployed location. The ability to surge to new operating locations is hampered by the “follow” UTCs. The greater benefit in surge capability may in fact be realized more in manpower than aircraft. The ability to train and equip personnel at home C-130 units is difficult. In the case of the KC-135 the “follow” UTC appears to have created more

difficulty because the desire to “pick-off” one or two KC-135s from an AAU for an exercise is more hampered by this constraint.

3. Helps maintain aircrew and maintenance expertise and experience levels by capitalizing on active duty Air Force investment in training and exploit Guard and Reserve resident experience

There is overwhelming agreement for this expected benefit. From the author’s own experience, as an AD member previously attached to an all ARC base for flying, it was eye-opening to see how many years and flight hours of experience are currently available within the ARC. In the units with “better” relationships, the ability and willingness to directly train and unofficially mentor younger AD members seems noticeable. Positive win-win relationships appear to be the best contributor to achieving this benefit.

4. Reduces peacetime training hours (cost savings) because of the higher experience levels of the ARC

No definite results were found for this benefit. Cost savings appears to be the biggest challenge to discern. Each AAU has slightly different circumstances surrounding its budget and resource agreements. The cost savings for peacetime training hours needs a tiger team to determine the metrics for analysis. A possible solution is to find an agreed cost per flight hour and determine the average hours per crew member required to achieve MR status each semi-annual period. It will be important to know when a crewmember is flying beyond the minimum required hours for MR status. It is not the author’s intent to recommend only flying the minimum hours, but rather to provide a measure for the minimum number of hours required to achieve MR status for a unit. This

would drive efficiencies in scheduling, for which the ARC have qualitatively been given the advantage. This data would clarify that assumption with quantitative results.

5. Preserves a corporate body of knowledge that balances turnover in active duty units, and enhances retention and recruitment for the Total Force through personnel cross-flow.

This is the original intent of traditional associate units. The Delphi members were split on this. The author asked the research question with regard to AMC. The data must be considered from that perspective. Had the questions asked about the benefit of AAUs on cross flow from AD to the ARC with regard to the entire Mobility Air Force, the results would likely have had different results. One Delphi member saw three AD personnel choose to continue service to the country via the ARC. On the flip side, another panel member commented that the AAUs may well serve to educate AD personnel as to the amount of time ARC members, Traditional and full-time Air Reserve Technicians, need to commit to their jobs for equivalent AD benefits. In this manner, AAUs could actually prove to be a drawback. If members looking to separate from AD do not perceive life in the ARC as, good for them, they may choose to separate rather transition to the ARC; in this case cross-flow metrics could be expected to decline. The desire to remain in one location and continuity to the individual's job are likely to remain a significant factor in transitioning from AD to ARC units.

Conclusions

The author, using the numerical ratings, Delphi participant comments, and personal conversations and experience has concluded the following five most important

benefits and drawbacks for AMC to consider as they look to develop metrics to evaluate AAUs.

Top Five Benefits

- 1. Access to more aircraft:** (B1) AMC gains more Capability through leverage of Reserve/ANG aircraft.
- 2. Experienced in ARC, training AD:** (B9) Leveraging the AFRC and ANG experience creates more well developed aviators for AMC.
- 3. Cost savings over new AD unit:** (B7) AMC saves costs by creating an AAU versus adding equivalent personnel, aircraft and infrastructure to an existing AD base.
- 4. Mission reliability rates of ARC assets:** (B2) Active Associate Units flying ARC aircraft should see higher off-station mission reliability rates than AD units.
- 5. Flexibility for AD pilot absorption:** (B8) Active associate units allow flexibility for AMC in absorbing more pilots in the event the AD Air Force needed to rapidly increase the number of student pilots graduating UPT.

Top Five Drawbacks

- 1. Geographically separated ADCON:** (D14) As ADCON leadership rotates there is a lack of understanding for those not in active associate units regarding the command authority and chains on command.
- 2. Limitations of “follow” UTCs:** (D7) Tasking Difficulties; If an AAU doesn't have a lead Unit Type Code (UTC), the unit cannot be tasked without another unit able to meet that requirement.

3. **Awards/decorations - fairness issues:** (D5) There is potential for a lack of fairness in the awards and decorations for active duty personnel stationed at active associate units.
4. **ARC work-hour flexibility constraint:** (D9) Single shift maintenance is a constraint for ARC units and requires AD units accept less desirable shifts if 2 or 3 shift maintenance is required
5. **Need good relationships for benefits:** (D1) Unresolved cultural differences between host unit and active duty will limit the benefit of the host unit's more experienced workforce for active duty

Additional information

As AMC moves forward looking for appropriate AAU metrics, one point the author discovered is the data available from AAUs will vary depending on the status of the unit. This is with respect to the amount of time the unit has been in place and the status of the host unit. This factor should be accounted for in analysis. For example, it may be worth establishing a time-line expectation for equivalent performance for an AAU just opening (e.g. at FOC, three-years after FOC, etc...). This caution may prevent a false assumption that newly opened AAUs will maintain the initially high levels of MR status. Until they are fully manned those units may have more flight hours available per crew member than a FOC AAU and may not be a valid comparison.

There was a great deal of criticism from the Delphi members when the ADCON is geographically separated. The consensus is that leadership is not intentionally overlooking the impact these units are having but are simply not educated enough on the command structure. The recurring element throughout this study was good relationships produce good associations. The author sees the potential to have a designated ADCON chain back to a leadership position

within AMC Headquarters at Scott AFB. The reporting chain could flow from 18AF through that Wing level equivalent leader, versed in all the idiosyncratic needs of each AAU to include both the operations and administration. Expecting a geographically separated Wing commander, with multiple on-base squadrons, to proactively serve the needs of additional geographically separated AAUs seems ineffective and inefficient. If the ADCON leadership for AAUs is not versed in TFI then the problems can be made worse. AAUs accomplishments and success are largely tied to the level of cooperative relationships on both sides of the association. The author would recommend geographically separated ADCON leadership for AAUs have either a greater level of TFI education, established a required level of previous experience within an association, or an entirely different command structure. It could be worth exploring legal constraints for the implementation of a Wing level commander for units lacking this local leadership; with intimate knowledge of all the MAF AAUs, stationed at Scott AFB and in the chain of command for 18th AF, this leader would likely be more effective at serving the needs of AAUs.

Weaknesses of the Study

The Delphi method is a proven tool for collecting data on subjects where no quantifiable data is currently available and for making future predictions based on collective wisdom. However, it is not as beneficial for quantifiable research when empirical data is available. As this data emerges, following the decision as to what will be collected and used; the Delphi will likely not be the right type of study for future analysis of AAUs. Instead, statistical predictions and larger scale surveys of people's perceptions benefits and drawbacks of AAUs may prove more useful to compare with actual benefit and drawback data.

Future Research

- A study needs to be done to determine the appropriate variables to measure costs of AAUs compared to AD units. Which parts of budgets are equivalent, which are sunk costs, which are fixed, and which are variable represent some initial consideration for this research.
- A baseline of cross flow metrics for AD members transitioning to ARC units needs to be established and from that baseline, measure the impact of AAUs on personnel cross flow to ARC units hosting and AAU versus independent ARC bases.
- The author recommends conducting a similar study to the research in this paper, using ARC SMEs to determine their consensus of benefits and drawbacks of AAUs. If the AD and ARC have opposing views of the same issues, relationships are likely to suffer and effectiveness of the unit is equally likely to fall short of optimization. On the contrary when both organizations perceive the same benefits, those areas can be exploited to the maximum benefit for all parties.

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REPORT DOCUMENTATION PAGE			Form Approved OMB No. 074-0188	
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1. REPORT DATE (DD-MM-YYYY) 18-06-2010		2. REPORT TYPE Master's Graduate Research Project		3. DATES COVERED (From – To) May 2009 – June 2010
4. TITLE AND SUBTITLE ACTIVE ASSOCIATE UNITS; Benefits and Drawbacks		5a. CONTRACT NUMBER		
		5b. GRANT NUMBER		
		5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S) Sjostedt, Travis, D., Major, USAF		5d. PROJECT NUMBER		
		5e. TASK NUMBER		
		5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(S) Air Force Institute of Technology Graduate School of Engineering and Management (AFIT/EN) 2950 Hobson Way WPAFB OH 45433-7765		8. PERFORMING ORGANIZATION REPORT NUMBER AFIT/IMO/ENS/10-12		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) HQ AMC/A8X Attn: Col Michael E. Peet 402 Scott Drive Unit 3L3 DSN: 779-3319		10. SPONSOR/MONITOR'S ACRONYM(S)		
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.				
13. SUPPLEMENTARY NOTES				
14. ABSTRACT <p>This study reveals through a consensus of subject matter experts which benefits and drawbacks of Active Associate Units (AAU) are believed to have the greatest impact to the capability of Air Mobility Command (AMC). This study helps identify critical areas for AMC to consider as they develop metrics and measures to evaluate the performance of AAUs and or when conducting a comparison of similar units. The process used the Delphi method to reach the consensus of five subject matter experts; it concluded after three rounds. The subject matter experts developed an initial list of 19 Benefits and 16 Drawbacks which were studied for consensus. The author concluded the Top Five Benefits and Drawbacks of AAUs.</p>				
15. SUBJECT TERMS <p>Active Associate Units (AAU), Total Force Integration (TFI), Future Total Force, Metrics, measures, Delphi method</p>				
16. SECURITY CLASSIFICATION OF:		17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 75	19a. NAME OF RESPONSIBLE PERSON Dr. Alan R. Heminger, AFIT/ENS
REPORT U	ABSTRACT U			c. THIS PAGE U

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18